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Railway Age

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October 11, 1930

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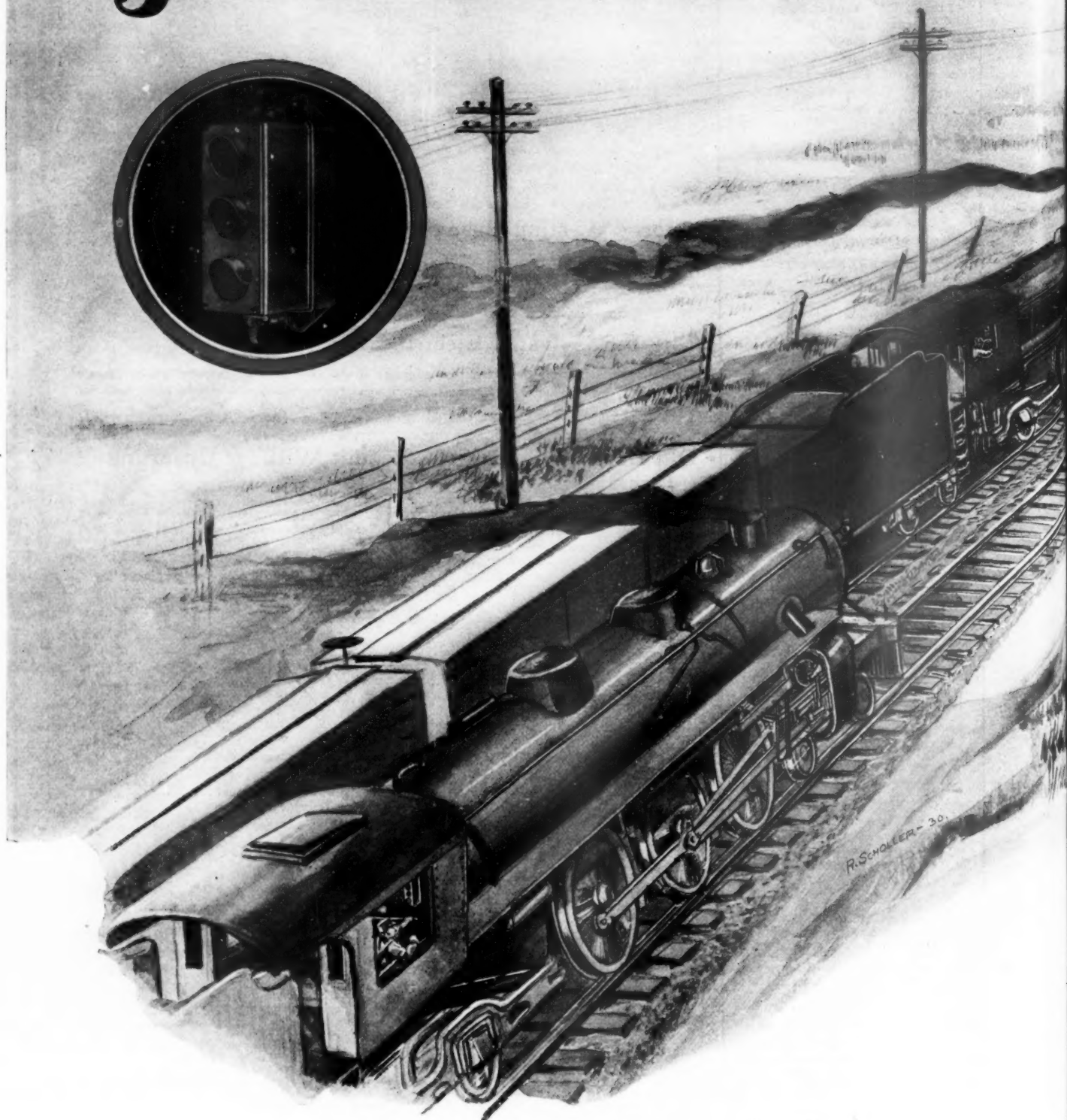
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When the Cab Signal turned 'Red'



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Railway Age

Vol. 89, No. 15

October 11, 1930

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A Railroad Situation that Demands Frankness

THE present situation and prospects of the railways indicate that radical changes must be made in both government and railroad policies if the railroad industry is to be saved from disaster. For almost a year it has been regarded as unpatriotic to tell the truth about general business conditions and tendencies. It is plain, however, that all the optimism which has been expressed regardless of facts has done business no good. Likewise it has not been popular to talk pessimistically in public about tendencies in the railroad field, but every well informed person is feeling and privately expressing great concern regarding the future of the railroads, and the time has come when what is being said privately should be said in public.

President Hoover, in his recent address to the American Bankers' Association, alluded to the fact that the railway situation is very unsatisfactory when he said that "during a period of depression the soundest and most available method of relief to unemployment is expansion of public works and construction in the utilities, railways and heavy industries;" that "the volume of possible expansion of construction in these private industries is about four or five times that in public works;" that "during the present depression these industries have done their full part;" and that "especially the railways have been handicapped by some provisions of the Transportation act."

They have been handicapped rather by the administration than by the provisions of the Transportation Act, but it is certainly true that, as the president said, "with wider public vision the railways could be strengthened into a greater balance wheel of stability." While, however, during this year they have largely increased their capital expenditures to help maintain general business, the reduction they have been forced to make in their expenditures for maintenance, because of their extremely inadequate earnings, has largely offset the beneficial effects of their increased capital expenditures. Throughout the year their gross earnings have grown relatively worse. They have had to retrench more and more in their expenditures for operation, and their reductions of almost 21 per cent in total earnings and of almost 17½ per cent in operating expenses in August were the largest yet reported. In spite of this large reduction of operating expenses the net return reported for August was only at

the annual rate of 3.38 per cent. This was the smallest yet reported for any month of this year. It brought the return earned in the first eight months of the year down to an annual rate of only 3.59 per cent; and final reports of car loadings in September indicate that the financial results gained in that month were equally poor.

The poor earnings now being reported are the result, not merely of the business depression, but also of influences which were operating prior to this year to reduce both traffic and rates, and the railroad problem is becoming so serious because of the danger that these influences will continue to operate after business begins to improve.

A solution for the railroad problem can be found only through the adoption of definite measures by the government and by railroad managements. There is no reason for hoping that the needed measures ever will be adopted until they have been publicly proposed and discussed; and they cannot be intelligently discussed without the full presentation of facts which are disagreeable, but which the public must be made to understand.

Their managers have felt great concern about the future of the railways before, and with good reason, but they never felt more concerned about it, or with more reason, than they do now. Until within recent years their principal fear was that the railways would not be able to get high enough rates for handling a rapidly growing traffic. Now they are so much concerned both because they fear that rates will be unfairly regulated and because they fear that the railways will not have enough traffic when general business revives. The large reduction of western grain rates recently ordered by the Interstate Commerce Commission after the western lines had been making poor earnings for years, and when they were making the poorest earnings since 1921, is sufficient justification for the apprehension of railway managers regarding future regulation of rates.

The Future of Traffic

Railway managers are so concerned about the future traffic of the railways because within ten years they have seen them lose forty per cent of their passenger business, have seen the growth of their freight business greatly decline and now see them confronted with new or comparatively new forms of competition which are rapidly increasing in effectiveness. Not much can be said about

the increasing competition of pipe lines excepting that they can transport oil and gasoline at lower costs than the railways, and in consequence the railways must give up to them a large amount of valuable traffic. The competition from highways and waterways from which the railways are suffering is due to different causes and raises entirely different questions.

If motor coaches and trucks were taking business from the railways merely because, like pipe lines, they could render transportation service at a lower cost, the railways would have no justification for complaining about their competition; but the facts are otherwise. Motor coaches and trucks are operating upon highways that have been built and are maintained at public expense, and are paying relatively smaller taxes than are being paid by the railways which have provided and maintain their own highways. Motor coaches are taking more and more passenger business from the railways, and the competition of motor trucks is rapidly becoming more serious. The size of motor trucks is increasing and, in many cases pulling trains of trailers, they are taking not only L. C. L. freight, but also, freight handled by the railroads in car-load quantities. Meanwhile, not only are these highway carriers not being adequately charged for the use of the highways, but the difference between the regulation to which they and the railways are subjected is so great as to place the railways at a further great disadvantage in competing with them.

Not satisfied that highway transportation should thus be fostered at the expense of both the public and the railways, the federal government is spending large amounts in the improvement of rivers and canals upon which it allows carriers to operate free of charge, and is also operating a barge line upon the Mississippi river system at a deficit which the public is paying in taxes. While it charges tolls on the Panama Canal, it so regulates the rates of the railways as to make it impossible for them to compete with steamships using the canal.

Railways and Governmental Solicitude

Considerable solicitude regarding the present condition and prospects of the railways is being expressed in high places in the government, but the railways need and have a right to receive something more substantial from the government than solicitude. They need and have a right to fair treatment from the government, and instead they are receiving from it outrageous injustice. The railroads are one of the country's greatest industries. They represent an investment of \$25,000,000,000 of private capital, are rendering a good and indispensable service, and are entitled to as good treatment from government as any other private industry. They are entitled to demand either that other means of transportation that compete with them shall not be subsidized by government or that the railways shall be subsidized as much in proportion as these competing means of transportation. They are entitled to demand either that competing means of transportation shall be regulated as they are, or that they shall be given the same freedom from regulation that competing means of transportation are.

The railroads have reason for concern as to the future of their traffic mainly because they are not treated by their government as other means of transportation are. Give the railways relatively as large subsidies as are being given to other means of transportation, or withdraw the subsidies from other means of transportation; regulate other means of transportation as the railways are regulated, or give the railways the same freedom from regulation that their competitors enjoy, and there will be opportunity to determine which means of transportation can serve the public at the lowest cost in proportion to the kind of service rendered. There is no such opportunity now because the railways are fighting competitors that in numerous ways are backed by the power of, and even actually include, the government.

Unfortunately, the situation is seriously aggravated by excessive competition between the railways themselves. The managers of the railways could more consistently complain of the kinds of government-aided external competition to which they are being subjected if they would join in repressing numerous kinds of competition between themselves that are helping to drag them down. Railway managers should unite, first, in stopping excessive competition between the railways themselves, and, secondly, in making a nationwide fight against the government policies which are unduly reducing their rates and helping other means of transportation to take traffic from them.

What Are Business Men Thinking?

It would be interesting to know what the business men of the country generally are thinking about present conditions and tendencies in the field of transportation. There are certain large banking houses that have great influence in both the railroad and other industries. Do they realize the menace to the railways that is involved, not only in the policy of regulation of the Interstate Commerce Commission, but also in the kind of competition between themselves and from other means of transportation, from which the railways are suffering? Do they realize that conditions and influences which may increase the market for trucks may also reduce the market for railway equipment and supplies and imperil the market for railway securities? Do they realize that the use by many big shippers of the power of their traffic to keep down railway rates and influence railway purchases is dangerous not only to the railways, but to every form of private business, first, because of its tendency to undermine railway service, and, secondly, because of its tendency to convince the public that big business is selfish and ruthless in its methods?

The large industries of the country have benefited enormously by the improvements in railway freight service that have been made within recent years, and business leaders have been generous in their praise of the railways for making these improvements. Do business leaders believe this service can be maintained when railway earnings become so inadequate that expenditures for the maintenance of railway properties must be reduced as they are being reduced now? Do they believe the railways can permanently make enough earnings to provide

good service if they are to be confronted more and more on every hand by government-subsidized and unregulated competition that takes traffic from them regardless of the actual differences in the costs incurred in handling it?

Meantime what are railway labor leaders and employees thinking? Are they fond of seeing employment on railways reduced through government aid to other means of transportation, the employees of which work longer hours and receive smaller wages than railway employees?

Public Must Be Informed

From numerous sources we hear solemn expressions to the effect that "nothing should be done to impair the credit or the excellent service of our great railroad system." From most of the same sources we hear the advocacy or defense of almost every kind of policy which tends to reduce railway rates and diminish railway traffic and thereby render it impossible for the railways to maintain their credit and service. Few men in either public or business life seem to realize the revolution that is occurring in the field of transportation, or the causes of it, or the menace it is, not only to railway credit and service, but even to private ownership of railways.

If public men, business men and the general public are to be so informed and influenced that present tendencies in the railroad industry will be corrected, they must be informed and influenced by railway men, by employees as well as by officers, and by other persons directly affiliated in interest with the railways, such as the manufacturers of railway equipment and supplies. Unless present tendencies in the industry are corrected, the nation may find itself confronted with a more serious railroad problem than it has ever before had to face.

Data for Superintendents

THE position of division superintendent is taking on more and more executive characteristics. The incumbent of such a position is vitally concerned with the administration of his division, with public relations, and with a dozen and one other things about which the superintendent of yore knew nothing, or had, perhaps, heard of only vaguely.

Nevertheless, a superintendent's prime duty is to supervise, to know every detail of his division and its operations, and the necessity for performing the new executive duties does not in any way relieve him of the basic duty which has been his ever since there were superintendents, namely, to know that his division is functioning properly, in all the elaborate and complex parts that go to make up the perfect railway operating machine.

It is not an easy problem, this re-adjustment of duties to find time for everything. On the other hand, it is not impossible. From the earliest time, superintendents kept some sort of rough records of what was happening, but since these records were individual and often merely

sporadic attempts at statistical pictures, they were inadequate for modern conditions. Accordingly, some five years ago, certain pioneers began to realize the need and provide for it.

These early attempts at providing a system-wide and uniform supply of information have grown to considerable proportions. Not only are an increasingly large number of railroads providing their superintendents with statistical information, but its timeliness is receiving considerably more attention. Reports that arrive so late as to be merely matters of historical record are of interest as such, but hardly of practical value in the intimate and immediate administration of the division. Thus, daily reports have come to be the rule. At the same time, from a few outstanding items, these reports have now grown in some cases to cover the entire operations, so that a complete and timely statistical picture of his division is presented to the superintendent each morning.

It is only necessary to converse with superintendents receiving such data to be convinced of its effectiveness. Of some fifteen interviewed recently, there has not been one who was not enthusiastic in his praises of it. And among those interviewed were more than one who confessed that, at one period of their careers, they regarded statistics as inconsequential trifles to take up the time of accountants and office boys, and of no value to the practical operating man. This opinion, needless to say, has undergone a radical change.

Will It Be Seen?

ALTHOUGH much has been said in disparagement of the engineer's knowledge and taste for aesthetics, it is an undeniable fact that most engineers make a sincere effort to produce works of tasteful proportions. That they have not always succeeded is due to lack of artistic talent rather than desire for accomplishment. However, it is to be questioned whether such efforts are always worth the trouble that they have involved. For example, in the course of a second-tracking project, an old arch bridge was widened for second track by the use of a plate girder span, a procedure which seemed at first thought to disregard all canons of aesthetics. But upon further consideration the justification for this action was obvious. The location was one where the structure would rarely be seen, so why make an effort to please the eye when there is no eye to please?

Obviously, if it costs no more to build a handsome structure than an ugly one, there is no excuse for adopting the ugly design. But why spend money for structures embodying architectural embellishments where the structure will rarely be seen. There are, however, plenty of places, as at highway-grade separations, parallel locations of two railroads, in the vicinity of cities and elsewhere, where considerations of advertising value or even a sense of artistic responsibility can well justify attention to the architectural composition of railway structures.



George Westinghouse Memorial Dedicated

*Beautiful work of art in appropriate setting commemorates
achievements and personality of great engineer
and industrialist*

ON Monday of this week, October 6, in the mellow, warm afternoon sunlight of an autumn day, in a wooded glen in Schenley Park, Pittsburgh, and in the presence of thousands of Westinghouse employees and guests, a beautiful and elaborate memorial was dedicated to the memory of the late George Westinghouse. Particularly appropriate, also, was the date—the eighty-fourth anniversary of Mr. Westinghouse's birth. He died on March 12, 1914. The memorial was erected and presented to the city of Pittsburgh by the George Westinghouse Memorial Association, composed of 54,251 members, mostly Westinghouse employees, with financial assistance from the Westinghouse Electric & Manufacturing Company and the Westinghouse Air Brake Company.

There is nothing conventional about the memorial. Rather does it portray in a simple and very concrete way the spirit and accomplishments of one of the greatest leaders in the field of modern invention and industry. Erected more than 16 years after the passing of Mr. Westinghouse, it is a measure, also, of the affection and high regard in which he was held by his fellows, not alone because of his achievements in engineering and industry, great as they were, but because of his keen appre-

ciation of the importance of the human element in industry. The first to institute the half holiday on Saturday, he led also in recognizing in many ways what in these days industry generally is beginning to understand as square dealing and mutual co-operation with the employees.

The central panel of the memorial shows Mr. Westinghouse working over the drawing board in a characteristic pose familiar to those who were closely associated with him. On either side, supporting him as it were, are two figures, one representing the worker in the shop and the other the engineering associate and office worker. Alongside the central panel are two wings, each containing three panels, on which are pictured Mr. Westinghouse's outstanding achievements, with suitable inscriptions. These include, for instance, his first and most famous invention, the air brake; the railroad signaling system; alternating current railroad electrification; the remarkable achievement of illuminating the World's Fair in Chicago in 1893 by alternating current; the hydro-electric plant at Niagara Falls, with the 5,000 hp. alternating current generators; and the steam turbine introduced into America by Mr. Westinghouse and now widely used for electric generation by steam power.

Standing some distance from these panels and facing them is the figure of an American youth, in heroic size, with school books under his arm and cap doubled in his fist, gazing in eagerness and expectation as if receiving inspiration from the scene before him. These pieces, all of gold-leafed bronze, rest on bases of jet black Norwegian granite, with the imbedded crystals of feldspar, which gleam blue as the rays of the sun strike them. The central panel and the American youth are the work of Daniel Chester French, possibly best known for his Lincoln Memorial statue in Washington. The bronze records of Westinghouse's six greatest achievements are the work of Paul Fjelde, an Italian sculptor. The beautiful setting of the memorial was designed by Henry W. Hornbostel, who also designed the Harding Memorial.

Message from President Hoover

The dedicatory ceremony was remarkable for its quiet impressiveness and dignity, in spite of the vast assembly which was gathered in the glen and along the hillsides. This was due in no small measure to the thoroughness and completeness of the arrangements and the splendid judgment exercised in the musical program and its presentation by the Westinghouse Employees Band and the Westinghouse Employees Chorus. A. L. Humphrey, in a characteristic way, outlined the purpose of the program and read telegrams from President Hoover, Andrew J. Mellon, Secretary of the Treasury, and Thomas A. Edison. President Hoover, in expressing regret over his inability to attend, said, "I have high appreciation of the outstanding accomplishments of Mr. Westinghouse during his notable career. The inventions he created and the industrial institutions he established have been a most substantial contribution to our American life. Characters such as he well deserve to be honored by their contemporaries and their successors. You do well to commemorate his memory."

Mr. Humphrey then introduced E. M. Herr, vice-chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, who acted as chairman.

The dedicatory address was made by Hon. James Francis Burke. In the course of the address he made these statements:

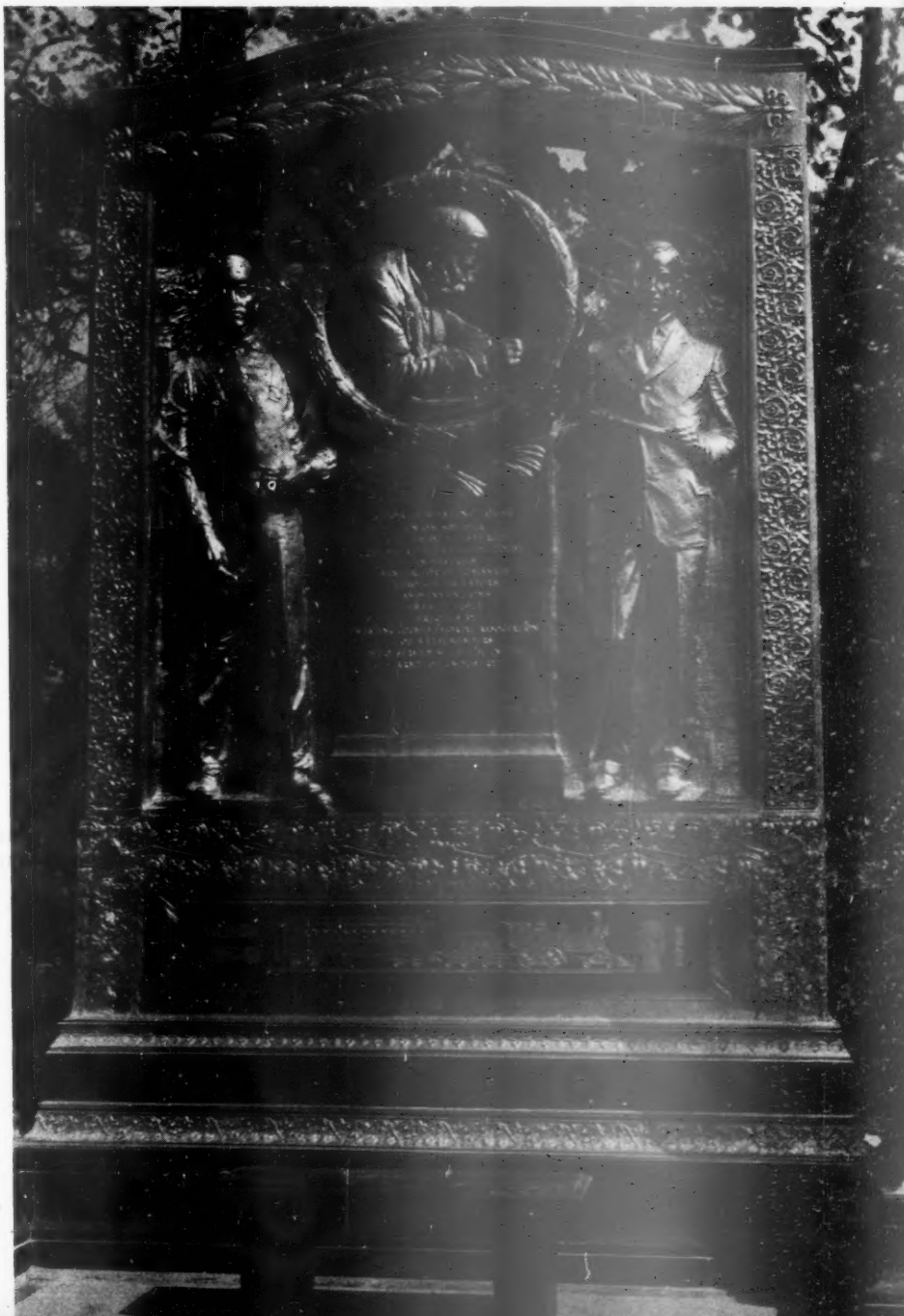
"Mr. Westinghouse was one of the most impressive figures and dynamic forces of his generation.

"Whether he was visualizing the future as he toiled in boyhood in his father's shop; whether fighting for his country in the Union cavalry or as an engineer in the naval forces of the Republic; whether he was perfecting his first invention to restore derailed cars to their tracks; whether he was mastering the difficulties he encountered while completing the air brake long since used on every continent; whether he was evolving his switch and signal system to protect rolling stock and human life from destruction, and save fabulous sums for the transportation companies of the world, the word failure never found a place in his lexicon.

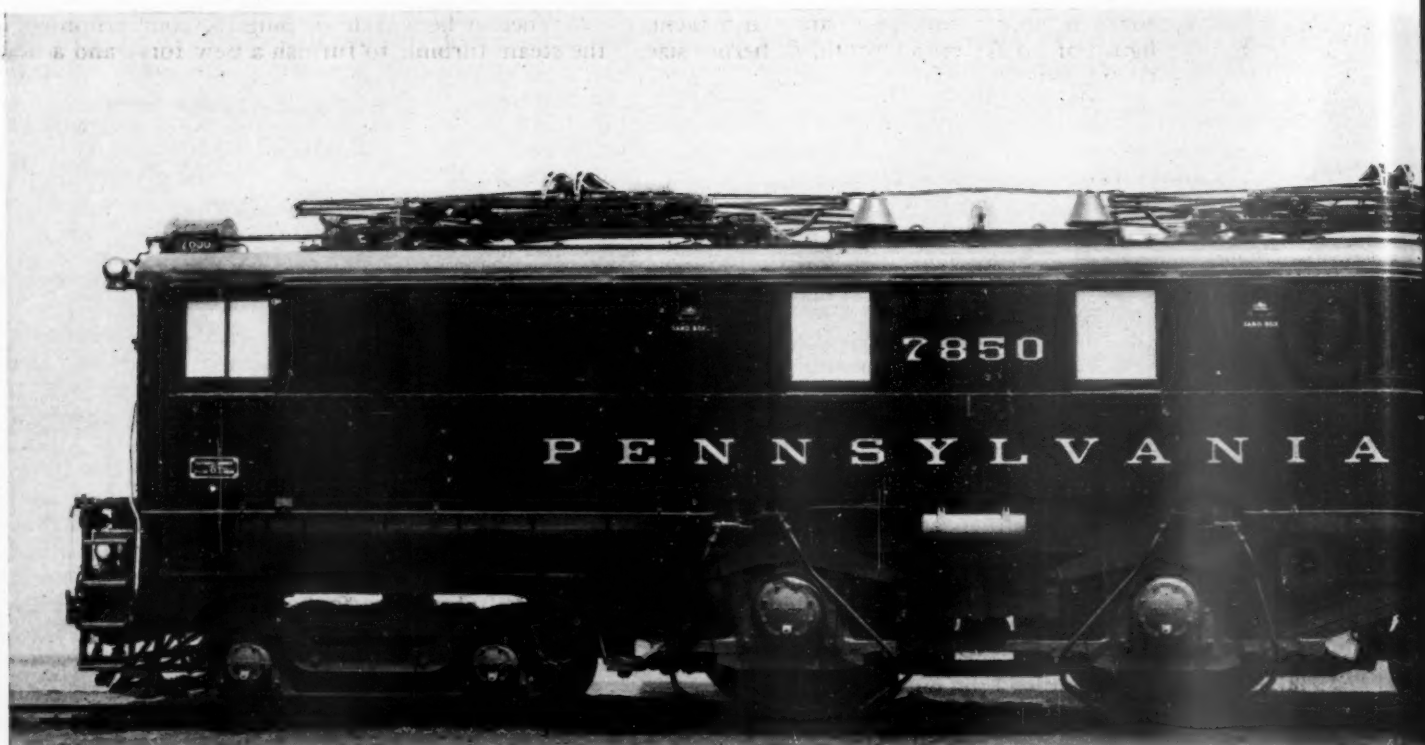
"Whether he was developing the combustion engine or the steam turbine, to furnish a new force and a new volume of power to countless lines of industry; whether he was threading the highways of this great city with gas lines to supply her mills and factories and heat and light her homes with a comfort and safety never before equaled in the history of any city in the old world or the new; or whether he was developing the most far reaching and valuable of all his contributions to science—the alternating current system—he forced his critics to yield to the spirit of progress, saw archaic methods disappear and a new order on the way.

"Whether he was establishing great industrial institutions with branches in many parts of the globe, whose capital aggregated over \$200,000,000, and whose activities gave employment to more than 80,000 men and women; or finally, whether he was traveling in triumph the highways of success or treading the Via Dolorosa that now and then has marked the journey of nearly every great character in history, George Westinghouse never wavered in his purpose or surrendered in his determination to enlarge and perpetuate the inventions and the institutions which he created as he journeyed down the years of an eventful life. * * * * * Set-backs seemed only to intensify his determination to attain his

(Continued on page 744)



Central
Panel of
Memorial



The Pennsylvania Electrification*

*Provisions have been made for all kinds of traffic
in greatly increased amounts*

By J. V. B. Duer

Electrical Engineer, Pennsylvania Railroad

ON October 31, 1928, General W. W. Atterbury, president of the Pennsylvania Railroad, announced that the board of directors had authorized a program of electrification, over a period of years, of the entire road train service, freight and passenger, between New York and Wilmington, Del., as well as the electrification of the grades between the Susquehanna, Schuylkill, and Delaware river valleys, and the eastern terminal of the railroad; a project covering a passenger and freight service of 325 mi. of line and 1300 mi. of track and extending from Hell Gate bridge in New York, where connection is made with New England, west and south to Wilmington and west on the main line in the direction of Harrisburg.

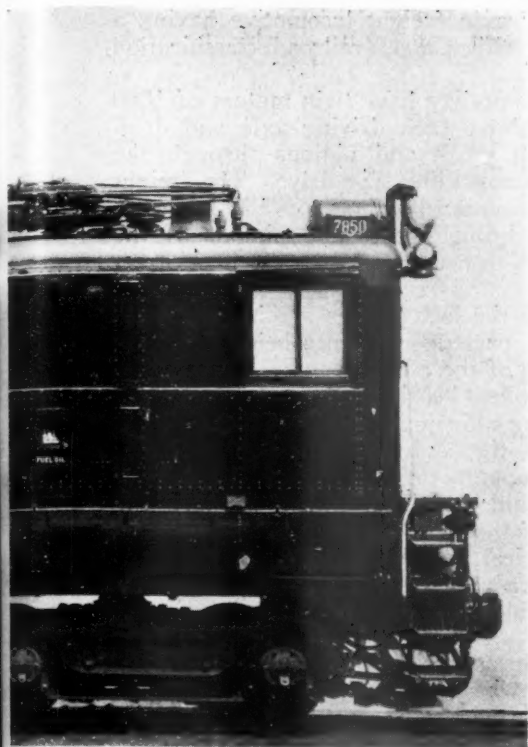
The authorization of the board of directors to inaugurate this electrification work followed exhaustive studies of the whole industrial and transportation situations in the eastern part of the country, including the terminal developments already under way or projected for Philadelphia and Newark. While this analysis was worked out in detail, on the basis of the traffic estimated for the year 1935, the probability was not lost sight of that by 1950 the metropolitan area around New York would extend to New Brunswick on the west and

well out on Long Island on the east and contain 30,000,000 people, and that there would be similar developments in other cities.

The system adopted is such that by the simple addition of increased power and increased rolling stock, a movement of any magnitude which it is possible to transport over the existing tracks and at a speed within the bounds necessary for safe operation may be handled as the demands of the traffic may from time to time require. The immediate factors which influenced the decision to proceed with the electrification were:

1. The greater economy of electric traction as compared with steam operation in dense traffic territory.
2. The growth of the southern passenger business.
3. The increasing density of both freight and passenger business in our eastern lines and the probability that in the future more rapid movement would be required.
4. The desirability of utilizing the advantages of electric traction in connection with the construction of the new passenger terminals at Philadelphia and Newark.
5. The desirability of building a locomotive that would meet the requirements from the standpoint of weight of train, speed, and reliability which it is believed will have to be met in this territory in the next 20 years.

* Abstract of a paper presented at the Pacific Coast Convention of the American Institute of Electrical Engineers, at Portland, Oregon, September 2-5, 1930.



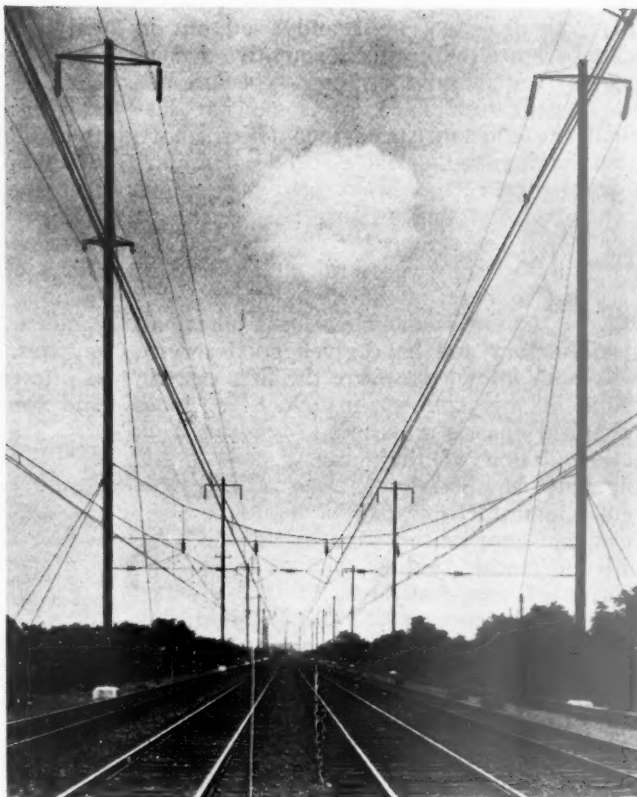
Two Driving Axle Passenger Locomotive—Railroad Classification O-1

6. The probability that the project could be completed with a less total expenditure, all matters considered, than if started at a later date.

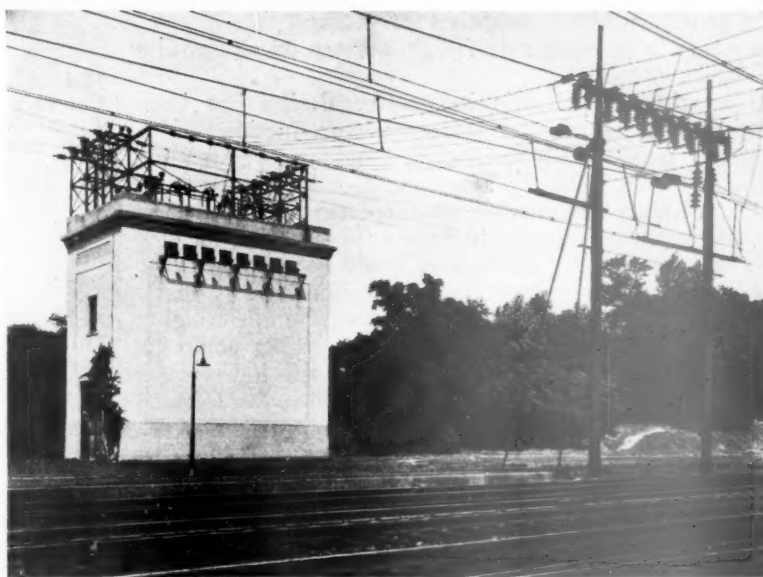
Of this program, the electrification of the New York division, from Philadelphia to Trenton, has been completed and electrical suburban service inaugurated; electrification of the Schuylkill division from Philadelphia to Norristown has been completed and electrical suburban service inaugurated; and at the present time electrification work is progressing from Sunnyside Yard and Jersey City to Manhattan Transfer and New Brunswick as an initial step in the operation of trains by single-phase locomotives from New York to Philadelphia, and for the operation of our suburban service between Jersey City and New Brunswick with single-phase multiple unit trains.

The announcement of this electrification program is the sequel to an interesting story of operating experience, of trial of electrical equipment, and of design and experimental work which started in 1905 when the Long Island Railroad was electrified, and which extends down to the present time when our electrification program is well under way and which covers experiments with d-c. electric locomotives and a complete trial of the single-phase system.

During the course of these experiments, an especially equipped section of the Long Island Railroad was used to develop the possibilities of this system, which, while not used for initial operation in the New York tunnels, was adopted shortly thereafter for the electrification of the suburban lines around Broad Street, Philadelphia. It has



Main Line Catenary and Transmission Line Construction on the New York Division Between Trenton, N. J., and Philadelphia, Pa.



Main Line 44 Kv. Substation at Bryn Mawr, Pa.—Capacity Four 2000-Kva. Transformers and Necessary Switching Equipment

now been selected as our standard system for use in the electrification program upon which this railroad has embarked.

To be prepared for an extensive electrification, it was necessary to develop single-phase passenger and freight electric locomotive designs, as well as multiple unit car designs, and, accordingly, in 1917 a constant speed, split-phase electric locomotive, (railroad classification FF-1), was designed, built and tried out in service. The experience with this locomotive led to the development of a commutator motor type locomotive (railroad classification L-5) of somewhat less horsepower than the constant-speed locomotive above referred to and having the variable-speed characteristics which experience seemed to teach were more suitable for a railroad handling a dense passenger and freight traffic.

Locomotives of this design were built and placed in service on alternating current in the Philadelphia territory, and on direct current in the New York terminal. They proved satisfactory and have given good service and to the best of our knowledge were the first electric locomotives built in this country in which a single design of mechanical chassis was used for the installation of the electrical equipment supplied by three different manufacturers, which parts, while not interchangeable with each other, produce a locomotive of practically identical transportation characteristics and of the same mechanical design.

In these locomotives, by change of gears, it is possible to have either a passenger locomotive for high speed or a freight locomotive for high tractive effort, and by change of type of control with which they are equipped it is still further possible to utilize them on 600-volt d-c. circuits, or on 11,000-volt a-c. circuits. In other words, by minor modifications in construction, they were designed as a general utility locomotive for use either in passenger or freight service on alternating or direct current.

The study of electric locomotive design has been continuously directed toward the production of a simpler, more easily maintained and more reliable locomotive, and shortly after the L-5 locomotive was built and placed in service, developments in the design of single-phase motors indicated to us that a still simpler and sturdier locomotive could be produced, the progress in single-phase motor design having made possible motors of sufficient capacity to handle weights on drivers permitted on our railroad which could be placed between the driving wheels of the locomotive, eliminating the necessity for jack shafts and side rods.

It was thought desirable to design some locomotives having these general characteristics and, accordingly, the construction of ten passenger and two freight locomotives was authorized. These locomotives are of three types:

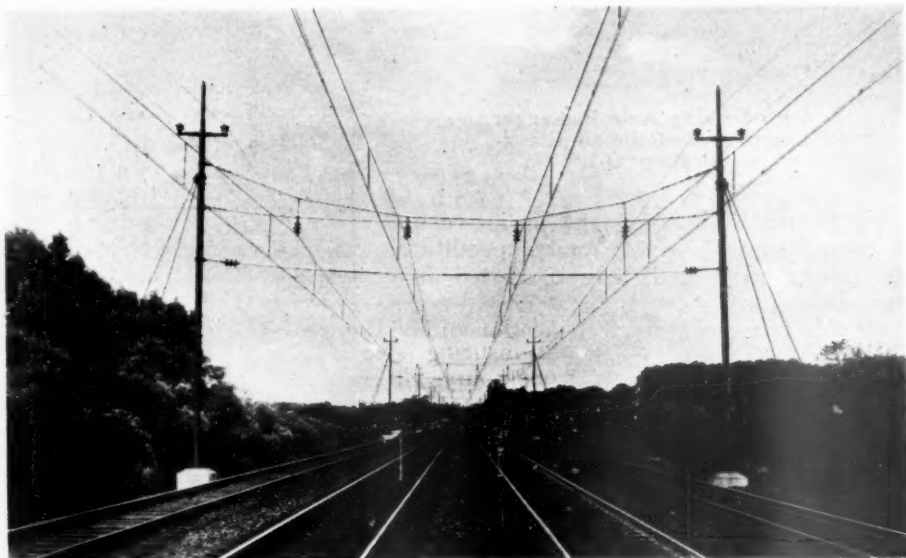
1. A two driving axle passenger locomotive having a four-wheel truck on either end (railroad classification O-1).

2. A three driving axle passenger locomotive having a four-wheel truck on either end (railroad classification P-5).

3. A four driving axle freight locomotive having a two-wheel truck on either end (railroad classification L-6).

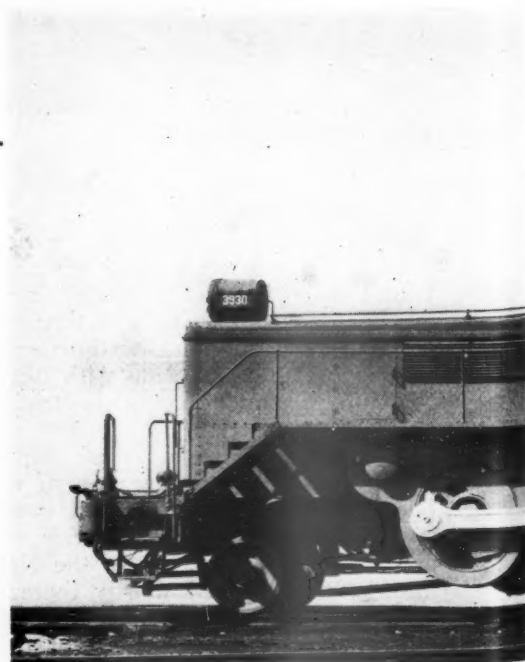
The passenger locomotives have twin motors of 1060 hp. each, mounted above each driving axle and driving the wheels with gears and pinions through the medium of the well-known link type drive. The freight locomotive has axle mounted motors of 530 hp. each, driving the wheels through gears and pinions of the same general type of construction as used in a street car.

The motors of all the locomotives are identical, the twin motors for the passenger engines being made up of two of the motors of the freight engines. All of the locomotives have roller bearings throughout—in the trucks, in the driving axle journals, and in the motor armature bearings,—the only plain bearings being those on axle to support the motors of the freight engine, and the quill bearings which support the quill in the frame of the twin motors on the passenger engines. The electrical apparatus on the locomotives is interchangeable to a very great extent, the auxiliaries and contactors are identical, and the transformers of



Main Line
Catenary and
Transmission
Line Between
Philadelphia, Pa.,
and Paoli, Pa.

Right—Four-
Driving Axle
General Utility
Locomotive—
Railroad
Classification L-5



the same design though of different capacities. These three types will be the standard until some further advance either in the art or in operating experience indicates further improvement in their design.

It might be interesting to note that locomotives of the L-5 and O-1 types were placed on the locomotive test plant at Altoona and were given a thorough period of test to develop the complete operating characteristics before being put into the service. Two of the O-1 type have been completed and placed in service.

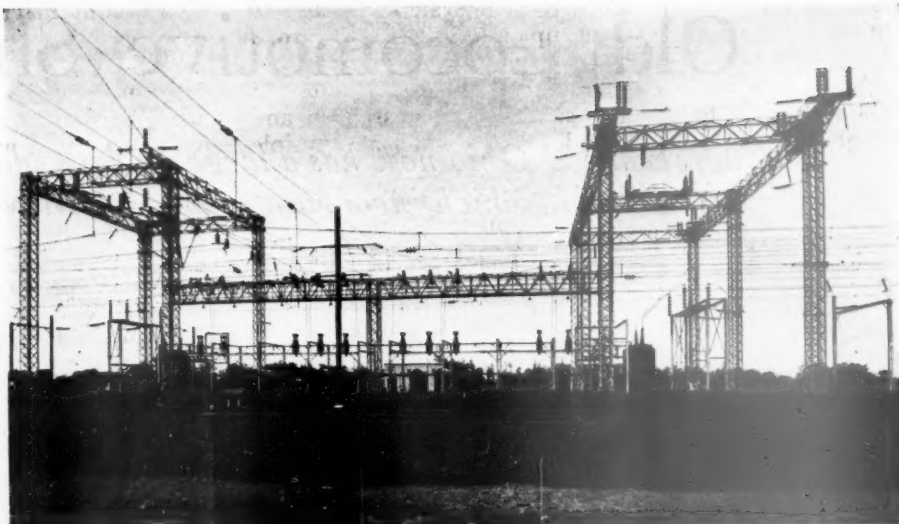
While the design and operating experience was going forward on the locomotives, the railroad was active also in developmental work in connection with the circuits for supplying the trains with current.

The initial installation in 1914 provided for 44,000-volt transmission circuits, indoor substations and oil circuit breaker equipment of relatively slow speed. A large part of the overhead catenary construction was of steel and was subject to frequent painting to keep it in condition for service. A brief summary of what has been done to make this layout of substations, transmission lines, and catenary construction more adaptable to railroad operation, as well as to reduce maintenance costs, is as follows:

On more recent electrifications 132,000-volt transmission is used instead of 44,000, thus providing capacity for the transmission of current from one end of a division to another and insuring against shut down due to the loss of any one source of energy.

Substations are now designed as outdoor stations, thus eliminating the major portion of the building with its attendant first cost and cost of maintenance.

Automatic circuit breakers are not used on the 132-kv. circuits, except at junction points where the circuits of one division must, under certain conditions, be automatically separated from those of another.

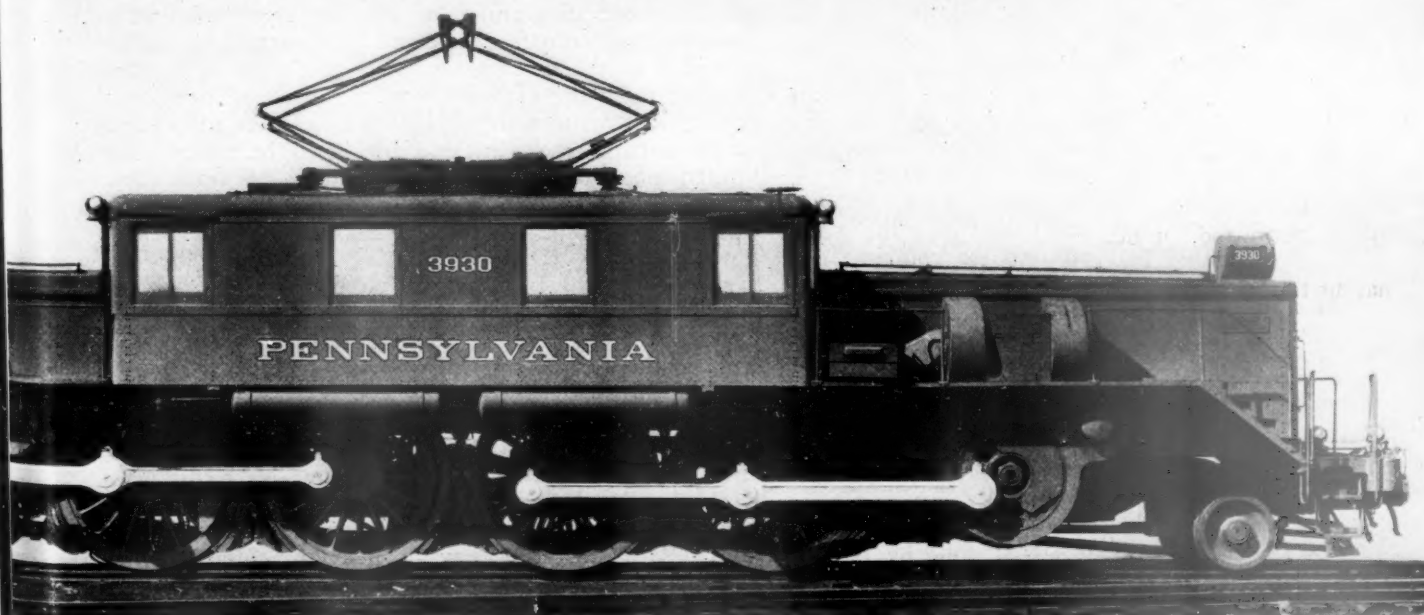


Main Line 132 Kv. Substation at Edgely, Pa. — Capacity Four 4500-Kva. Transformers and Necessary Switching Equipment

The trolley circuit breakers on our original installations operated in 12 cycles, including the relay action, and ruptured 30,000 amperes successfully. Our modern trolley breakers, however, must operate in one cycle, including the relay action, and rupture 50,000 amperes. One of the electric companies developed for our service an air break trolley circuit breaker not requiring the use of oil and capable of rupturing currents of the same magnitude and in the same time as our latest oil trolley circuit breakers. We have purchased and installed many of these air breakers and they are giving successful service.

Experience with overhead catenary construction led us to believe that continuity of service secured by the use of non-corrosive materials was of sufficient value in operating reliability to warrant the use of these materials and, accordingly, all of our catenary construction, except parts of material bulk, is of bronze or copper and such bulky pieces are galvanized malleable castings. By this means, painting and other maintenance attention to the overhead catenary system is

(Continued on page 762)



Old Locomotive Shop Is Rebuilt

Chesapeake & Ohio now has a large modern plant at Huntington, W. Va., which incorporates many features of interest

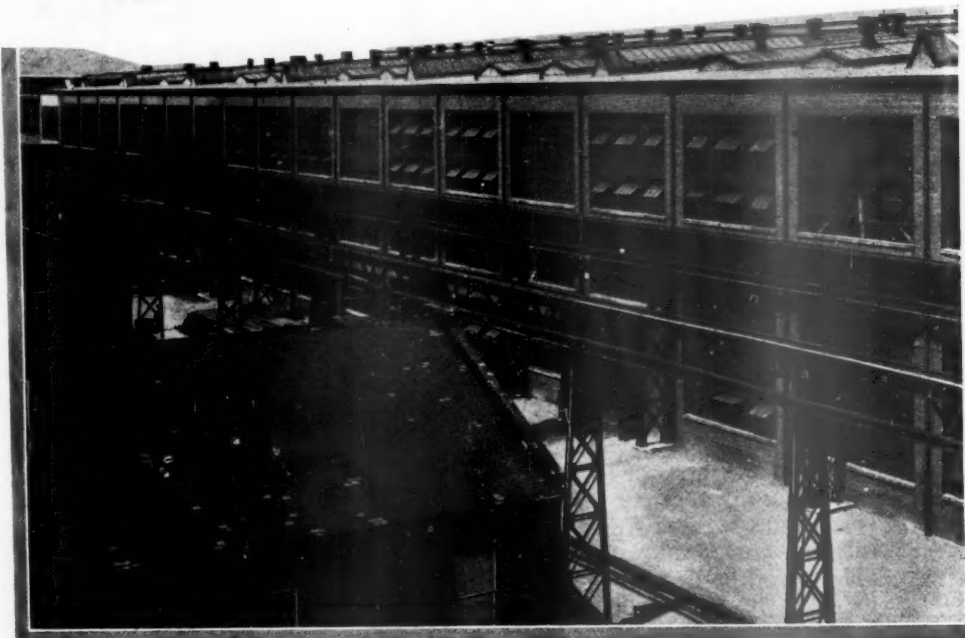
ONE of the most important locomotive shop improvement projects to be completed in the country during the last year is that of the Chesapeake & Ohio at Huntington, W. Va., where the changes made in the old facilities were so complete, both as regards layout and method of operation, that for all practical purposes the rebuilt shop can be considered as practically new. In addition to more than doubling the original floor area, the old shop has been changed from one of the longitudinal type with auxiliary shop facilities in separate buildings to a transverse shop with practically all auxiliary units grouped together under one roof.

All of the features entering into the layout and equipping of the new shop were designed with the view to providing maximum output of locomotives requiring heavy classified repairs with the least possible detention from service and with a minimum expenditure for labor. Mass production methods similar to those used by the more progressive automobile manufacturers, are employed throughout the shop, and all facilities and units of equipment provided are so located and arranged that there is short, straight-line movement throughout the shop of all materials and parts undergoing the many repair processes. As a result the new shop will accommodate 37 locomotives undergoing repairs at one time, and has capacity for making 50 Class 2 and 3 repairs per month, whereas the maximum output of the old shop was 30 such repairs per month, and at a cost considerably higher than is resulting under the new arrangement.

Work on the new shop was started early in March, 1929, and was completed the latter part of February of this year, after about eleven months of intensive construction activity within, about, and directly over the old shop facilities. The significant feature in this connection is not alone the speed with which the work was done, but the fact that through the complete cooperation of the Chesapeake & Ohio and the contractor, and the most judicious planning, all of the work was carried out without reducing the output of the old shop during the entire period of construction.

New Facilities Differ Greatly From Old

The old locomotive shop facilities at Huntington consisted principally of three main units; a three-track longitudinal Mallet shop, about 400 ft. long by 69 ft. wide; a machine shop, about 390 ft. long by 160 ft. wide; and a boiler shop, about 410 ft. long by 140 ft. wide. The machine shop was the oldest of these three units and lay in a general north and south direction,



Looking Northeast Over the New Main Unit

flanked on the north by the Mallet shop, which was constructed in 1918 to permit the repair of the heavier power then coming into general use. The boiler shop, on the other hand, which was constructed in 1925, lay about 150 ft. east of the machine shop and parallel with it, the intervening space between these buildings being occupied by a transfer table which served both of these buildings as well as the Mallet shop.

With this layout of facilities, power was brought into the Mallet shop and unwheeled with the aid of two 150-ton cranes, and all except the larger units were moved to the transfer table and then carried to tracks provided in the machine shop or the boiler shop, depending upon the class of work required. The larger power was, of necessity, held for all classes of repairs on the outside tracks in the Mallet shop, because of the limited length of the machine and boiler shop tracks. While the track space in the Mallet shop had become of insufficient capacity with the increased use of heavy power, possibly the most limiting feature of the old facilities was the fact that the old Mallet shop was of insufficient height to permit the moving of locomotives back and forth over the tops of others in the shop. This made it necessary to keep the center track open so that locomotives could be carried back and forth between power undergoing repair on the outside tracks.

In the rearranged and enlarged facilities, the Mallet and boiler shops remain, but both have been enlarged, while the old machine shop and the transfer table were removed and were replaced with a large building housing a 25-pit erecting bay, a heavy-machine bay, a light-machine bay, and a fourth bay for driving box, axle and wheel work. All of the units in the new lay-

Without Upsetting Operations



of the Locomotive Shop at Huntington, W. Va.

out now adjoin each other, without separating walls, and are, therefore, for all practical purposes, under one roof. With this rearrangement of facilities, all of the disadvantages encountered in the old shop have been overcome, this being due largely to the new erecting pits provided, each of sufficient length to hold the largest power, and the fact that the old Mallet shop is now used only for a series of progressive stripping and finishing operations on incoming and repaired locomotives.

Old Mallet Shop Considerably Enlarged

The remodeled Mallet shop, which is now that only in name, consists mainly of a steel frame structure, about 400 ft. long by 69 ft. wide, with brick walls, steel sash, and a frame roof with a central longitudinal monitor having continuous ventilating sash along both sides. This main unit is supplemented along its south side by a 40-ft. lean-to bay of substantially the same type of construction, which is used primarily for the repair of main and side rods, valve-motion and reverse gears. The three tracks in the old shop, each with pits throughout their lengths, still remain, as does also the old wood block floor.

The principal enlargement of this shop was made on the north side, where an additional bay was added, 52 ft. wide. This bay, which has a height of 41 ft. 6 in. from the floor to the lower chord of the roof trusses, has a mezzanine floor along its north side, 16 ft. above the shop floor, and a second floor throughout, 26½ ft. above the main floor. The frame of the bay is of steel, all floors are of creosoted wood blocks on a concrete base, and the roof is constructed of

precast concrete tile protected with built-up roofing and provided with a longitudinal peaked monitor with a continuous skylight on one side. The exterior walls of the new bay, as in the case of all other extensions to the shop units, are of common red brick, with large areas of steel sash glazed with translucent glass.

The first floor of the new bay in the Mallet shop is laid out in four main units, which include a pipe shop occupying the entire west half of the bay, a jacket shop, and separate areas for the repair of air and boiler feed pumps and pneumatic devices. The mezzanine floor is occupied entirely by locker, wash and toilet rooms, and is open on the shop side. The second floor in this bay is divided transversely into two almost equal parts, one for a tin shop and the other for the repair of brass work and air and boiler mountings. Each of these two areas is served by a three-ton electric freight

elevator, which runs to the ground floor, as well as by stairways for the use of employees.

Main Addition Houses Four Shop Units

The main new shop structure, which covers in excess of the area formerly occupied by the old machine shop and the transfer table between the machine shop and the boiler shop, is 315 ft. wide and is divided into four main bays. The principal bay in this new shop unit is an erecting bay, which is 95 ft. wide and 608 ft. long and which extends along the full width of the east end of the Mallet shop. This bay has a clear height of 55 ft. 8 in. to the roof trusses, which permits the movement of locomotives over one another on the pits, and the pits themselves are spaced 24 ft. center to center, providing adequate room for working between them.

To the west of this bay are the machine bays, the first being 80 ft. wide and used for heavy machine work, while the outside bay is 60 ft. wide and is used for light machine work. These bays are 550 ft. long and abut on the Mallet shop to the north. The heavy machine bay has a clear height of 50 ft. to the roof trusses, while the light machine bay has a second floor throughout its length, 28 ft. above the first floor, and a mezzanine floor 25 feet wide along its west wall, 16 ft. above the first floor. Both of these upper floors are connected to the main floor by stairways and are open on the side facing the main shop.

Along the east side of the erecting shop is an additional bay, 80 ft. wide by 625 ft. long, and 38 ft. high, which is used as a wheel shop. This bay, like the other three new bays, is provided with a creosoted wood-block

floor on a concrete base, and is housed over by a continuous roof structure. Directly over the erecting bay, the roof is of the monitor type with vertical side panels of continuous ventilating sash, while over the machine bays and the wheel bay, the roof structures are of the lean-to type with a series of transverse hip monitors, equipped with asbestos-protected metal ventilators and skylights fitted with corrugated wire glass.

The exterior walls of the new shop unit are of brick, with large areas of steel sash with translucent glass. All of the steelwork in the new unit is painted with white lead and oil, while the inside faces of the exterior walls are painted mill white with a dark green dado.

Details of Shop Layout

All of the pits in the erecting bay are constructed of concrete, 80 ft. long by 4 ft. wide, and are provided with plank jacking floors along both sides. All of the pit tracks are at least 115 ft. long, and extend 25 ft. from the east end of the pits into the wheel shop, providing storage space for repaired wheels directly on the pit tracks. Six of the tracks extend 37 ft. into the heavy machine bay, and one other track, near the center of the bay, extends across the entire shop layout, through the boiler shop, to a flue shop east of the boiler shop, and through the machine shop bays to a blacksmith shop building, which lies west of these units. Still another pit track extends into the blacksmith shop, both of these latter tracks being standard gage and used as drolley tracks for transferring parts and materials from one shop to another.

The heavy machine bay is unobstructed throughout its area, but is laid out in nine sections for different classes of work. The larger of these sections include one for the repair of engine and trailer trucks, boosters and stokers; another for the repair of frames, pilot beams, deck and draw castings; a third for the repair of cylinders and heads, steam chests and valves; an-

other for the repair of pistons, rods, cross-heads and guides; and still another for miscellaneous work. Smaller sections are provided for bolt and pin work, shoe and wedge work, and for a tool repair shop. A special area in this bay, at its extreme south end, is set aside for the repair of locomotive cranes and roadway equipment.

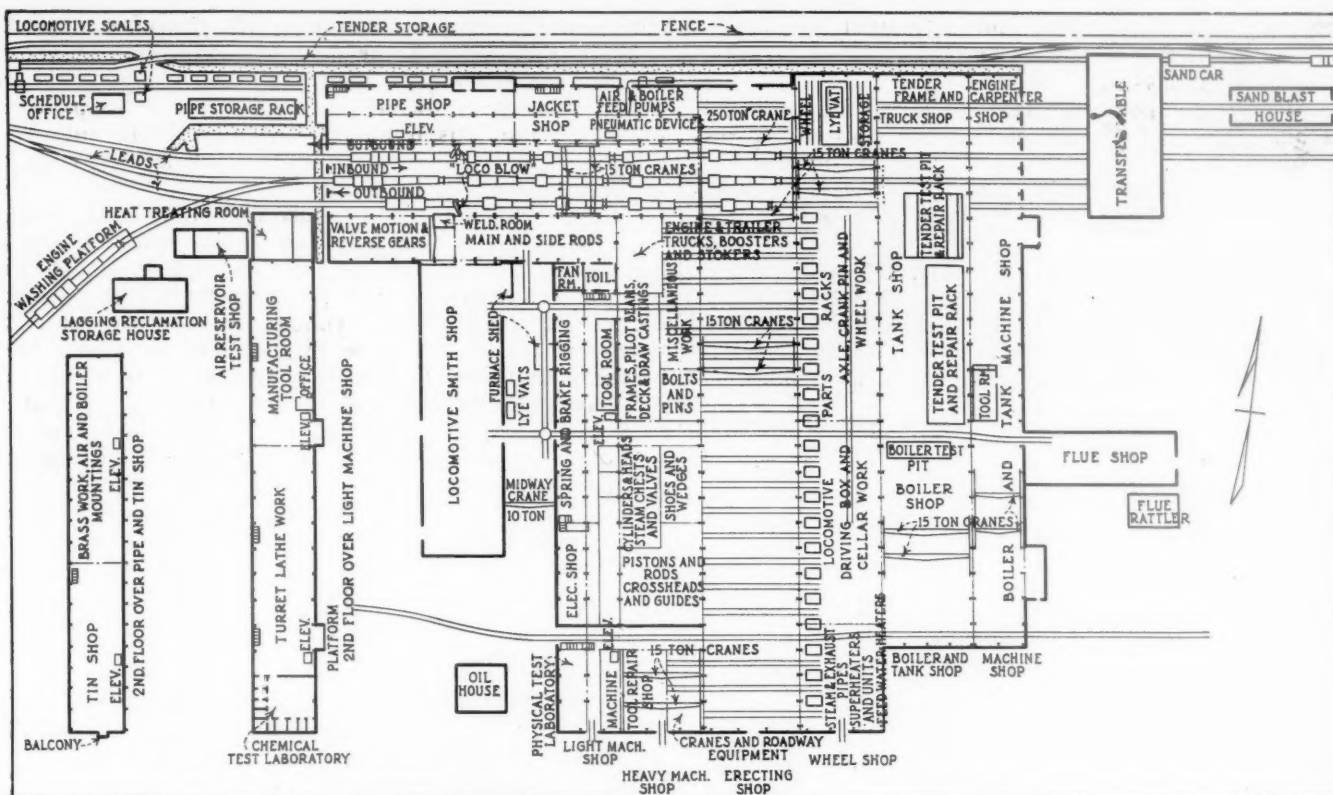
The light machinery bay is also laid out for different classes of work, the main groups on the first floor including an electric shop, a spring and brake rigging group, and a smaller section provided for the repair of throttles, reverse levers, cylinder cocks, and similar locomotive parts. A large distributing tool room is located within this bay near the north end, adjacent to the heavy machine bay, and in the extreme southwest corner of the bay, there is a physical testing laboratory.

The mezzanine floor in the light machine bay is used primarily for wash room and locker facilities, but space is provided at the north end of this floor for shop offices. The second floor level in this bay is divided into two principal parts, one for turret-lathe work, and the other for the manufacture of tools. Both of these areas are connected to the main floor by three-ton electric freight elevators, and in addition, an electric dumbwaiter connects the manufacturing tool room with the tool distributing room on the main floor. At the south end, directly over the physical testing laboratory, is a chemical testing laboratory.

The wheel shop is divided transversely into three main sections, the one at the extreme south end being used primarily for the repair of such units as superheaters and feedwater heaters, while the other two sections are for driving box and cellar work and for axle, crank pin and wheel work. At the extreme north end of the wheel shop bay, a lye vat of sufficient size to take an entire set of engine wheels at one time, is provided, with wheel storage tracks along both sides. Throughout the length of the wheel shop, steel racks are provided between the extensions of the erecting pit tracks for the storage of locomotive parts which do



A Section of the New Heavy Machine Bay Before All of the Machines Were Set Up



General Layout of the New and Rebuilt Shop Facilities

not require repairs, or for holding other parts before or after repairs have been made.

The boiler shop unit of the locomotive shop, which lies directly alongside the new wheel shop, was not altered materially, except for an extension of about 140 ft. at its north end. This extension is served by five tracks, three of which are extensions to the pit tracks of the Mallet and erecting shops. All five tracks extend east of the new shop area and are served by the transfer table formerly used in the old layout between the machine and boiler shops.

About 80 cranes of various types and capacities serve the different shop units. The larger of these include a new 250-ton crane and three new 15 ton cranes, all of the traveling type, in the erecting shop; two new 15-ton traveling-type cranes in the Mallet shop, replacing two 150-ton cranes used there formerly; two new 15-ton cranes of the same type in the wheel shop; a new 15-ton traveling crane in the boiler shop, supplementing an old 50-ton crane of this type; two old 15-ton traveling type cranes serving the boiler machine shop area along the east side of the main boiler shop; and a new 15-ton traveling-type crane, which operates over a storage area along the south side of the new erecting and machine shops.

The smaller capacity cranes provided are of various types, but by far the majority are jib cranes of one and two-ton capacity, operated by electric hoists, located in the wheel, boiler and heavy machine shops for handling work to and from machines.

Lighting, Heating and Ventilation

Daylighting of the shop is amply provided through liberal areas of steel sash in the exterior walls of the new units, and the equally liberal areas of skylights in the roof. Altogether, about 55,500 sq. ft. of wall sash and about 54,200 sq. ft. of skylights are provided. Ventilation is provided by 105 roof ventilators and about

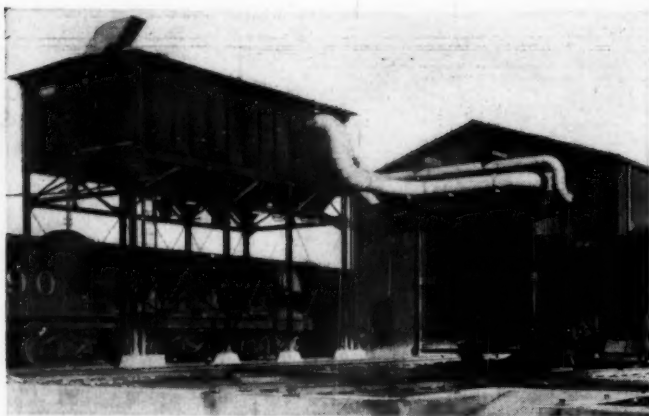
6,000 ft. of ventilating sash in the side walls and roof monitors.

Artificial lighting of the shop is provided by overhead electric lights in dome and angle reflectors, the lights in each case being located where they produce the most effective results, and yet where they do not interfere with crane operation. In addition to the ceiling and wall lighting, plug receptacles for extension cord lights are provided at the columns along the erecting bay, and each of the erecting pits is equipped with three twin receptacles for the same purpose.

Electric power circuits carrying a.c. and d.c. current are also carried throughout the shop for machine operation and welding, drops with receptacles being provided at practically all of the columns. The power used at the shop is purchased from a local power company, which delivers 3-phase, 60-cycle a.c. current at 33,000 volts. This is stepped down to 2300 and 440 volts in a local substation of the Chesapeake & Ohio, for distribution within the shop. All d.c. power used at the shop is generated in a power house of the railroad at Huntington.

Heating of the shop is by unit heaters, 54 new heaters of this type being installed along the columns and walls of the new shop-units. Steam is supplied to the heaters by the power plant of the Chesapeake & Ohio and is delivered to the shop through a 10-in. supply main located in a pipe tunnel. Within the building, the steam lines are carried overhead.

All service pipe lines within the shop, like the steam lines and electric conduits, are carried overhead in the roof trusses, with outlets at the walls or columns, or are brought down to the floor and then continued underground to the erecting pits or to specific machine tools. These lines carry compressed air and water to each erecting pit, oil and natural gas to certain of the forges and rivet heaters in the machine shop, and water to electric refrigeration drinking fountains and to urinals



A Modern Sand Blast Plant Was Included in the New Facilities

which are placed at intervals throughout the various building units.

The layout of facilities and the method of operation at the Huntington shops are based largely on an extended study made of the larger railway shops of the country and on detailed time studies made of the various machine operations necessary within the shop. As a result of these studies, the entire layout is based on mass production methods, with short, straight-line movement of materials and parts undergoing repair. All machinery is located in groups for each specific kind of work, and is laid out to permit the work to be done in such sequence as to avoid all unnecessary handling of parts. While certain machinery of the old shop was used in the new layout, many new machine tools were provided, a number of which were designed especially to facilitate and speed up the work to be handled. Practically all of the machines within the shop have individual motor drive.

Special attention is given to the co-ordination of the work in all departments of the shop. This is accomplished mainly by means of a shop schedule and routing system, which not only calls for timed and systematic movement of locomotives through the shop, but which also provides for the consistent flow of finished materials to the erecting shop. In order to make this system effective, all locomotives scheduled to be shopped are inspected at least 90 days in advance of shopping, and a report is made of any unusual items of materials required so that these materials can be ordered and be on hand when the locomotives arrive at the shop.

There are many and varied details in the program followed in shopping locomotives in the new layout and, therefore, no attempt is made here to do other than give a general idea of the movement of locomotives



Looking South Over the Remodeled Tank and Boiler Shop

through the shop in undergoing heavy repairs. A locomotive and tender received at the shop ordinarily arrive with the fire dumped, the ash pan cleaned and the boiler blown down and drained of water. Just outside of the Mallet shop on the engine lead from the Huntington enginehouse, back-shop forces wash out the front end, ash pan and fire box, and clean the exterior of the locomotive. From this point the engine and tender are pushed into the Mallet shop, on the center track, where the tender is disconnected and taken to the tank shop for repairs, and where stripping work is done on the locomotive, progressively, as it is moved eastward to a position on the same track directly within the erecting shop. At this point the locomotive is picked up by the 250-ton crane in the erecting shop and placed on an assigned pit, where further stripping operations take place. If the locomotive undergoing repair is to have a new fire box, it is moved directly into the boiler shop, where the boiler is lifted off, instead of being taken immediately to one of the erecting pits. It is then moved back into the erecting bay, where it is unwheeled and taken to an assigned pit.

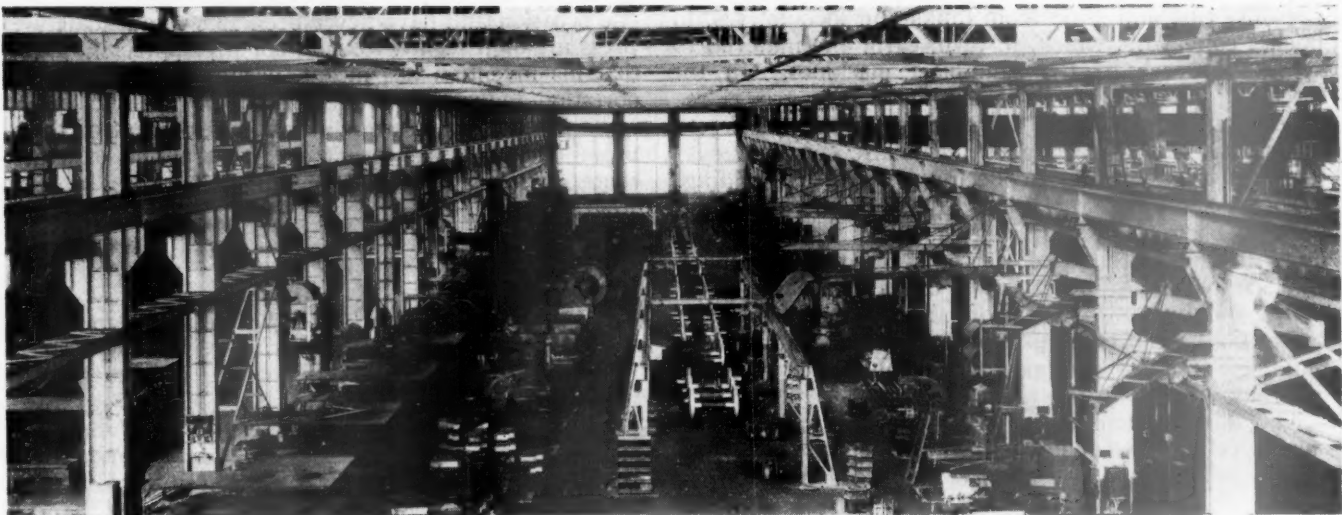
The wheels removed from locomotives are rolled directly into the wheel shop, where they are picked up



The Old Mallet Shop as Re-equipped for Stripping and Finishing Operations

by the 15-ton crane in that shop and placed in the lye vat for cleaning. From this point the wheels and boxes go through progressive movements of inspection and repair, until they are again assembled and set on the end of the erecting pit track holding their locomotive.

The assembly of repaired parts and equipment on a locomotive follows a definite program, much the same as stripping operations. After all parts removed from the locomotive while on an erecting pit have been replaced, the locomotive is wheeled and then carried by the 250-ton crane to one or the other of the two pit tracks forming extensions to the outside tracks in the Mallet shop, which tracks are used exclusively for finishing work on outbound power. The most northerly of these tracks is used for all heavy locomotives of the Mallet and other types, while the south side track is used for all classes of smaller power. This division of outgoing locomotives is provided not only because the lighter power requires less time for assembly and inspection, but also so that the larger engines will all be placed on the side of the shop nearest to the pipe and tin shop. As the locomotives are moved westward through the Mallet shop, finishing work continues progressively, and when they are released from this shop



A View Toward the North in the New Wheel Shop

they are connected to their tenders and are ready for immediate road service without further adjustments.

The tender work at the shop is all carried out in the shop units provided for this class of work, and is so scheduled that tenders are always ready to be moved out with their respective locomotives. Upon uncoupling a tender from an incoming locomotive, it is switched back over a new lead to the west end of the shop, and is then moved northeast of the new shop layout over a new track provided along the north side of the shop. Here it is sand blasted and given a priming coat of paint, and then moved over the transfer table into the tank shop. After it has been repaired and painted, it is taken back over the transfer table and is held on a tender storage track, until its locomotive is released from the shop.

New facilities at Huntington, other than those already described, include a sand-blast house, a new system oil and waste storage building and two separate wash, toilet and locker buildings. The sand-blast house, which is the most interesting of these auxiliary units,

was constructed to provide suitable facilities for cleaning tender tanks preparatory to repair and painting, and for removing scale from locomotive boilers. This house is located about 200 ft. east of the tank shop on one of three tracks, all of which have extensions over the transfer table into the tank shop.

The house itself, which is about 100 ft. long by 30 ft. wide, is a steel frame structure, entirely inclosed with corrugated asbestos-protected metal siding and roofing, except for steel sash in the sides and a pair of double-hinged steel car doors on each end. Within the building there is a main central bay where sand blasting work is done and along the sides are passageways which are entirely separated from the sand-blast room by steel plate partitions and doors.

The equipment within the building consists of six sand-blasting machines, three on each side, which employ steel grit for blasting operations. The track within the house is carried on girders, beneath which are six collecting hoppers, each served by a worm conveyor. These conveyors carry the grit from the machines and



Looking North Through the New Erecting Shop

the dirt, rust and scale from tanks and locomotives, to bucket conveyors, which, in turn, carry the material to screens at each of the sand-blast machines. In the screening process, which is automatic, the grit is reclaimed and returned to the machine, while the waste material is carried through a pneumatic conveyor system to a waste and dust collector west of the building.

In the system of removing dust from the air in the blasting chamber, there are two 18-in. fresh-air inlet ducts at the east end of the building, near the floor level, and two 18-in. air outlet ducts at the west end of the building, near the roof. The latter ducts have connection with the dust-collecting unit outside the building, and are equipped with fans to extract the dust-laden air from the plant.

The dust collector, or arrestor as it is called, is a small steel inclosed structure, which is elevated on steel framework, directly over a service track along the west side of the sand-blast house. This facility is equipped with a series of hoppers through which the waste material can be drawn off directly into cars for removal.

The capacity of the sand-blast house will permit the cleaning of one boiler or three tanks at a time, or if passenger cars are cleaned at times, as is expected, it will take one passenger car and one tank. Under usual conditions, two men can clean a tank in about one hour, or a passenger car in about two hours.

All of the design and construction work in connection with the shop improvements at Huntington were carried out under the general direction of C. W. Johns, chief engineer of the Chesapeake & Ohio, with the co-operation of J. W. Small, chief mechanical officer of the road. H. L. Vandament, district engineer, was in direct charge of the work in the field, while actual construction was done under contract by the United Engineers & Constructors, Inc., Philadelphia, Pa.

George Westinghouse Memorial Dedicated

(Continued from page 733)

purpose and to conquer in the end, and the world is enriched as a consequence."

The memorial was unveiled by Herman Westinghouse Fletcher, a grandnephew of Mr. Westinghouse, and now a student at the University of Virginia. The presentation of the memorial, in behalf of the Westinghouse employees and associates, was made by George Munro of the Westinghouse Veteran Employees' Association. Mayor Charles H. Kline of Pittsburgh, received the memorial for the city.

The ceremonies for the day terminated with a dinner during the evening at the William Penn Hotel. A. L. Humphrey introduced the toastmaster, A. W. Robertson, chairman of the board of directors of the Westinghouse Electric & Manufacturing Company. Addresses were made by Congressman James M. Beck of Philadelphia, former Solicitor General of the United States; by Rt. Hon. Lord Southborough, a prominent industrialist of England; and by John F. Miller, vice-president of the board of directors of the Westinghouse Air Brake Company.

W. W. Atterbury, president of the Pennsylvania Railroad, in commenting on Mr. Westinghouse's early work, recently made this statement:

"In the old days I had the privilege and pleasure of meeting with the inventor of the air brake on more than

one occasion and have never been able to adequately express my high regard for him nor my appreciation of all that his invention has meant, particularly to the transportation industry. The year 1869 is not such a long while ago, but when we view the development of the air brake and all it has meant over that period of years a conception is gained of how marvelous has been our progress."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading continued to decline in the week ended September 27 to a total of 950,381 cars, a reduction of 252,758 cars, or 21 per cent, under the total for the corresponding week of last year which was the peak figure for 1929. As compared with 1928 the reduction was 246,584 cars. This represents a greater spread between the figures for this year and those of 1929 or 1928 than has been reported in any previous week. The reduction as compared with the preceding week was 2,131 cars. All classes of commodities and all districts showed reductions as compared with the corresponding weeks both of 1928 and 1929. Loading of miscellaneous freight was 107,370 cars less than that in the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Loading

Week Ended Saturday, September 27, 1930			
Districts	1930	1929	1928
Eastern	204,151	271,280	264,405
Allegheny	184,606	241,637	236,346
Pocahontas	57,004	68,361	63,811
Southern	130,936	157,503	163,875
Northwestern	144,085	182,023	186,103
Central Western	148,013	179,037	182,296
Southwestern	81,586	103,298	100,129
Total Western Districts	373,684	464,358	468,528
Total All Roads	950,381	1,203,139	1,196,965
Commodities			
Grain and Grain Products	43,119	49,049	63,325
Livestock	28,976	35,000	36,743
Coal	153,183	211,001	206,304
Coke	7,951	12,422	10,795
Forest Products	42,159	63,781	66,615
Ore	48,095	68,857	62,104
Merchandise, L.C.L.	244,733	273,494	270,568
Miscellaneous	382,165	489,535	480,511
September 27	950,381	1,203,139	1,196,965
September 20	952,512	1,167,395	1,144,131
September 13	965,713	1,153,274	1,138,060
September 6	856,637	1,018,481	991,385
August 30	984,504	1,162,100	1,116,711

Cumulative Total, 39 weeks...35,158,648 39,920,026 38,224,762

The freight car surplus for the week ended September 15 averaged 391,819 cars, a decrease of 12,631 cars as compared with the preceding week. The total included 209,845 box cars, 130,836 coal cars, 22,204 stock cars, and 12,258 refrigerator cars. For the period ended September 23 the surplus was 389,687 cars, a further decrease of 2,132 cars, including 203,408 box cars, 133,822 coal cars, 22,218 stock cars and 12,717 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended September 27 totaled 70,774 cars, a decrease of 1,932 cars from the previous week and a decrease of 14,806 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
Sept. 27, 1930	70,774	30,811
Sept. 20, 1930	72,706	32,587
Sept. 13, 1930	77,342	31,205
Sept. 28, 1929	85,580	42,024
Cumulative Totals for Canada		
Sept. 27, 1930	2,375,962	1,309,456
Sept. 28, 1929	2,659,738	1,609,928
Sept. 29, 1928	2,628,587	1,526,174

Grade Crossing Accidents Discussed at Safety Council Meetings

*Importance of constant safety education also considered
by Steam Railroad Section—C. W. Galloway
principal speaker*

GRADE crossing accidents — the most serious safety problem now facing the railroads—and the importance of constant safety education, by every available means, of railway employees and the public alike, were the two related subjects most fully considered at the nineteenth annual meeting of the Steam Railroad Section of the National Safety Council, held at Pittsburgh, Pa., from September 30 to October 2. Including a featured address by C. W. Galloway, vice-president of the Baltimore & Ohio, on the highway crossing situation, some 20 papers, covering as many different phases of railway accident prevention work, were presented at the five sessions of the convention. Of these, three dealt directly with the question of safety at railway-highway crossings, and a number of others referred to this general subject; while all, except for a few which were of a highly technical nature, stressed the value of steady and continual safety education. In general, papers on crossing accidents and on education were delivered at the earlier meetings of the railroad section, and will be considered in this article, while the more technical papers, most of which were read at the later sessions, will be reported in the *Railway Age* of October 18.

Although unfavorable business conditions were credited with being the chief factor in keeping the railway attendance down to about 425 delegates—approximately two-thirds of the number present at the Chicago convention in 1929—the Steam Railroad Section was again one of the best attended divisions of the entire Congress, its members representing about 18 per cent of the total attendance, as compared to 13 per cent of the total last year. Delegates to all sections



**Officers of the Steam Railroad Section,
National Safety Council**

Standing, left to right: W. A. Booth, director of safety, Canadian National, secretary, 1929-1930, and vice-chairman-elect for 1930-1931, and C. F. Larson, superintendent of safety, Missouri Pacific, the retiring chairman. Seated, left to right: J. L. Walsh, superintendent of safety, Missouri-Kansas-Texas, elected secretary and news-letter editor for 1930-1931, and George H. Warfel, assistant to general manager, Union Pacific, vice-chairman, 1929-1930, and chairman-elect for 1930-1931.

of the Congress numbered between 2,300 and 2,400.

Officers elected at the close of the third session to head the Steam Railroad Section for the year 1930-1931 included George H. Warfel, assistant to general manager, Union Pacific, Omaha, Neb., chairman; W. A. Booth, director of safety, Canadian National, Montreal, Que., vice-chairman, and J. L. Walsh, superintendent of safety, Missouri-Kansas-Texas, Dallas, Tex., secretary and news-letter editor.

In opening the section's first session, on September 30, the retiring chairman and chief presiding officer, C. F. Larson, superintendent of safety of the Missouri Pacific, reviewed his own experiences in general railroad and safety work, and then continued as follows:

There are two national organizations, the Safety Section of the American Railway Association, and the National Safety Council, whose purposes are to save human lives, to reduce accidents and save from harm the employees in industry, the passengers who travel by land and sea, or in the air. ***Under the influence of these organizations results

have been obtained that are startling as one studies and analyzes the reports showing the steady decline in fatal and non-fatal accidents to employees on duty on the American railways and other industries. We know, and it has been truthfully said that education is the only practical means of bringing the individual to a realization of what an accident would mean to himself and his family, of his duty and responsibility with reference to the safety of himself and others and to the protection of property. This education must be continuous, constructive and interesting. We all know how well this program has been carried on.

We also know that the foundation for successfully teaching the principles of safety lies in the schools and the homes of the nation. It is from these sources that our children must learn the hazards that face the normal child or grown person, and be taught to safeguard life and limb. Knowing all of these things, the National Safety Council is carrying safety teaching into the schools by specially prepared literature and

illustrated posters. In this particular feature your Section has also been diligent. *** It is no new suggestion that we should seek opportunity to get into the schools and seek to bring the message to teachers and pupils alike. ***

The great public problem is the grade crossing accident and the National Safety Council has done as much to face the motor vehicle accident problem as any other force engaged in effecting an improvement from the devastating state of affairs that exists nation-wide. ***

In view of the immensity of the task there is certainly no gainsaying the apparent negligibility of actual accomplishment; but this does not at all detract from the significance of a real beginning. Nevertheless, actual tackling of the problem has revealed to its undertakers a painful lack of interest on the part of those whom we are trying to save. This reference to the automobile accident problem is to the whole problem, not only that aspect in which the railroads are primarily concerned—the grade crossing problem—but as it relates to the highways of the country and to the streets of the cities and towns. The Steam Railroad Section of the Council, through its activities is supplementing the splendid and tireless efforts of the Safety Section of the American Railway Association, which is so relentlessly fighting a battle of education concerning the ever-present dangers lurking at the railroad-highway crossing. The efforts of the National Safety Council are more directly concerned in bringing about safe and sane driving at all times and at all places, and this will directly have its effect upon bringing to the attention of the driver the necessity for being careful at the railroad crossings.

From this point, Mr. Larson went on to review the work of the Railroad Section during the past year, referring particularly to the rules for the use and operation of motor cars and hand tools drawn up by the Engineering Committee (A. N. Reece, chief engineer, Kansas City Southern, chairman), and to the publicity work done by the Poster Committee (L. G. Bentley, general safety agent, Chesapeake & Ohio, chairman). He also announced a change in the rules governing the National Safety Council contest awards to keep any one road from being a constant winner in its group. The new rule provides that "the successful winners in one year must drop out if they are successful again the succeeding year, but without precluding their return again after having dropped out for one year."

Committee Appointed to Co-operate with A. R. A.

In discussing the relations between his own organization and the Safety Section of the American Railway Association, and in reporting the appointment of a joint committee to consider the work of the two bodies, Mr. Larson spoke as follows:

In the conduct of our work, and the work of the Safety Section of the American Railway Association, where the results sought are identical and to be derived from identical sources, there seems to be overlapping and duplication of effort, and, in some cases, interlocking committees.

Were it not for the high class personnel of the two organizations there would be conflict that would arouse and engender feelings that might make the results doubtful as to success. We are thankful that never in the past has this been manifest. However for the purpose of minimizing the duplication of effort, your chairman has appointed a committee consisting of J. E. Long (Delaware & Hudson), chairman, with C. E. Hill (New York Central) and D. H. Beatty (Southern) serving with him to carefully consider the relations which exist and should exist between the Steam Railroad Section, National Safety Council, and the Safety Section, American Railway Association. The chairman of the latter organization (H. A. Rowe, Delaware, Lackawanna & Western) has appointed a similar committee and they will co-labor in developing a plan of procedure that will bring about even closer co-ordination of effort than now exists.

Safety Contest Methods

The second speaker on the program, George H. Warfel, assistant to the general manager of the Union Pacific, presented the report of the Railroad Section's committee on safety contest methods, of which he served as chairman during the year 1929-1930. After

analyzing methods used in conducting safety contests among employees on 101 Class I roads, and making some general comments on the value of such contests, Mr. Warfel summarized his committee's conclusions on bases for equalizing contesting groups, the kinds of accidents to be counted, the possibility of weighting accidents in proportion to their severity, and the methods of grouping contestants.

In concluding his report he stated that the fundamental requirement of all safety contests was that they should accurately reflect the actual situation, and should report every accident correctly, as to cause, extent of property damage, and severity of personal injury. "The safety man should be scrupulous to eliminate such minor cases as are rightfully excluded by fair and honest application of the rules," he added, "but be equally zealous to see that every one of them contemplated by the Interstate Commerce Commission rules is impartially recorded." The report of Mr. Warfel's committee will be reprinted in full in a subsequent issue of the *Railway Age*.

Grade Crossing Accident Prevention

Detailed discussion of the present undesirable situation with regard to accidents at railway-highway grade crossings was begun at the first meeting of the section, by the report of its committee on the prevention of highway crossing accidents. C. L. LaFountaine, general safety supervisor of the Great Northern and chairman of this committee, read the report, which is reprinted in part below:

There were 2,485 fatalities at highway grade crossings in 1929, a decrease of 3.2 per cent as compared with the number killed in 1928, and 6,804 injuries, an increase of 2.1 per cent in comparison with the number for 1928. While it is to be regretted that we had a slight increase in the number of injuries as compared with the previous year, everyone who put forth any effort in the cause of prevention of highway crossing accidents should feel highly compensated in the fact that there was actually a saving of 83 lives. This was accomplished in the face of an increase of seven per cent in the number of automobiles registered, together with a greater density of traffic on the railroads than in any former year.

To my mind, however, the record for the first six months of this year as compared with the same period last year is most conclusive evidence that our combined efforts have been effective. The records show a decrease of 338 highway crossing accidents, 158 fatalities and 356 injuries. Every agency or individual who has had to do with bringing about these results should be inspired not only to continue this campaign but to put forth greater efforts.

The work of this committee has been that of endeavoring to educate the automobile driving public in the need of exercising greater care, especially at railroad grade crossings, and to impress them with their responsibility in grade crossing accidents. ***

While the committee feels very grateful for the active interest in this problem taken by the Council, we do not feel that we have been able to reach the public as a whole with our message. In the National Safety Council we have an accepted public institution which is in a position to be of valuable service to us and I would like to suggest at this time to all the members, and especially to the chairman and members of the Grade Crossing Committee of the American Railway Association, that they take advantage of the large resources available in the Council and furnish them with all available data dealing with the grade crossing accident problem.

This committee feels that we should all be very grateful for the very valuable educational work done by the press. ***

It has been our aim through our educational campaign to cut down the toll of all automobile accidents, whether at grade crossings or elsewhere, for it should be remembered that the grade crossing accidents constitute only a small portion of the safety problem which the automobile has brought with it.

Viewing the constantly mounting toll of deaths and injuries in automobiles, street and highway accidents of approximately 11 per cent annually for the past 10 years, this committee believes that more emphasis should be placed upon the proposition that the right to operate a motor vehicle on a

public highway is a privilege conferred by the people, and should be restricted to such persons as qualify physically, mentally, morally and financially before competent officials, and are found to have adequate knowledge of traffic rules and regulations, and sufficient skill and responsibility to drive a motor vehicle on a public highway without unduly endangering the lives of others. To this end we respectfully direct your attention and solicit your support.

Prevention Activities on Missouri-Kansas-Texas

Mr. LaFontaine's report was followed by a paper on "Grade Crossing Accidents and Their Elimination," prepared by J. L. Walsh, superintendent of safety, Missouri-Kansas-Texas, describing changes in crossing signals, whistles and whistling rules, and methods of checking enginemen and inspecting crossings which have made it possible for the Katy to reduce its grade crossing accidents by nearly 40 per cent in the past 10 years. His discussion of the subject is reprinted in full herewith:

During the year 1929 grade crossing accidents caused 38 per cent of the deaths and 9 per cent of the injuries occurring on American railroads, the economic loss being estimated at \$16,800,000. This condition has developed in the past 20 years, is one that will remain with us for all time, and leads up to the question of what the railroads can do to meet this new condition forced upon them by modern highway transportation agencies.

New Crossing Whistle Adopted

Comparing the year 1929 with 1920 the Missouri-Kansas-Texas Lines show a decrease of 39 per cent in grade crossing contacts, 49 per cent decrease in deaths, and 37 per cent decrease in injuries. The same comparison shows a 35 per cent increase in the number killed in the United States, while the motor car registration shows an increase of 293 per cent. Early in 1921 we changed our highway grade crossing whistle from two long and two short blasts, to two long, one short and one long blast, the last blast to continue until the locomotive has passed the crossing. At the same time we made the whistle available to the firemen on all passenger trains and formulated special rules requiring the firemen to sound the regulation whistle in emergencies. During the year 1920, and before the fireman had access to the whistle 200 cars approached from the fireman's side, against 95 from the engineman's side. Since that time the number is nearly equally divided. We believe this method of whistling has gone far in preventing contacts by giving the best warning that can be given the public when approaching a railway.

Enginemen Checked and Crossings Inspected

Efficiency tests as to whistling should be done by safety department men. We do this in an automobile, and the results

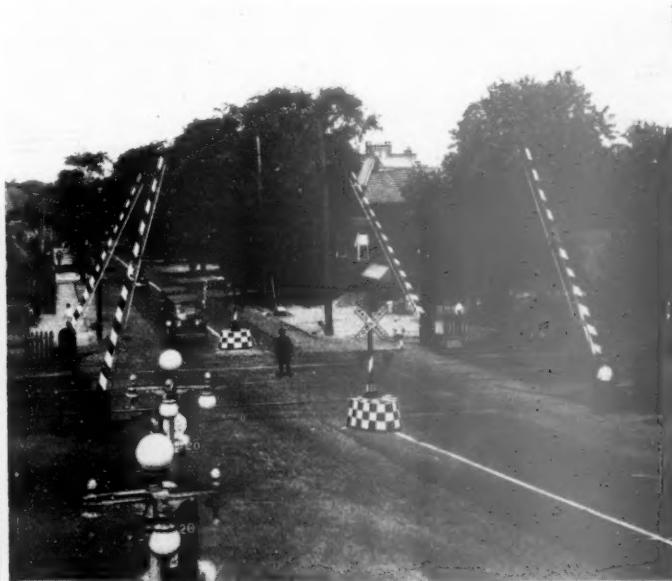
of such tests are submitted to the division superintendents for handling, our office keeping a card index for each engineman tested. We also maintain a card index covering all enginemen, on which is shown the number of cars struck and number of people killed and injured. This card also shows results of efficiency tests. In this manner we are kept well posted as to what individual enginemen are doing, and by writing up the poor performances frequently, the division superintendent, general superintendent and general manager are kept posted. When one man shows poor results as to tests or as to striking cars, he is called in by his superintendent, and we find that by so handling him an improvement is forthcoming.

The physical condition of all crossings should receive attention. It is our policy to make an inspection of all crossings on motor cars every other year, making record of obstructions that can be eliminated or improved, as well as the physical condition of crossings. We then keep after these conditions until such improvement has been brought about. There are many buildings in smaller towns that obstruct the view of crossings, that bring no revenue to the railroad and should be removed to open up a better view. The safety department should pass on all new leases and thereby keep objectionable obstructions from obscuring the view. We believe that the safety departments are the best qualified to pass on conditions at grade crossings, and therefore should assume the entire responsibility.

New M.-K.-T. Whistle Described

If, as we believe, the whistle properly sounded will reduce highway grade crossing accidents, then an improvement in the whistle itself should receive consideration. For the past seven months we have been experimenting with a whistle located on the front of the engine ahead of the stack. This whistle is enclosed within a frustum of a cone or reflector. It greatly lessens the sound annoyance to people living near the railroad, as well as to passengers on the trains, directs the whistle sound ahead to the crossing where it is needed, and does away with the complaint of our enginemen by removing the sound of the whistle far enough from them so that it is not harmful to the ear. This fact alone will get a more complete compliance with the whistle rule. The public is continually complaining of the whistling, so unless something is done to overcome this feature, we may expect laws to be passed that will decrease the whistling, and when this is done we may look forward to a greater number of highway grade crossing fatalities.

In concluding his talk, Mr. Walsh exhibited a small model of the whistle mentioned in the last paragraph, which is now being tried out on several Katy passenger locomotives. A more complete description of the new whistle has also been given in an article entitled "Missouri-Kansas-Texas Tests Efficiency of Whistle," prepared by Mr. Walsh and published in the *Railway Age* of July 12, page 67.



Elimination and Protection—Two Effective Methods Used by Railways to Reduce Grade Crossing Accidents

The exhibition of the whistle model and Mr. Walsh's review of his company's success in lowering the number of crossing accidents on its lines aroused marked interest among the delegates. A number of questions were asked as to the whistle's effectiveness in calling in rear flagmen and fulfilling its other purposes, while representatives from several roads stated that they had also found it advisable to make a careful check on the use of crossing signals by enginemen.

L. & N. Reduces Fatalities 85.7 Per Cent

E. G. Evans, superintendent of safety, Louisville & Nashville, corroborated Mr. Walsh's statements by reporting that his road had experienced an equally satisfactory reduction in its grade crossing accidents since the adoption, on March 1 of this year, of the new whistle signal—two long, one short and one long blast, the latter to end just as the locomotive reaches the crossing. In the six months between March 1 and September 1, he added, grade crossing collisions on the L. & N. had been reduced by 47.5 per cent, as compared with the corresponding period for 1929. On the same basis, fatalities in grade crossing accidents had decreased by 24, or 85.7 per cent, and injuries by 77, or 52.7 per cent, a record more than twice as good as that for the country's railroads taken as a whole, and one which has been continued successfully throughout the month of September. In reply to questions, Mr. Evans stated that the signal is supposed to last 10 seconds; that it is begun at a point governed by the speed of the train and not necessarily at the whistling post; that enginemen are warned for their first failure to give the proper signal and suspended for their second, and that exceptions to the general rule are made only in towns or cities with many street crossings within a short distance. He gave it as his opinion, however, that the type of signal is relatively unimportant, so long as the whistle is blown somehow as the locomotive approaches the crossing.

Galloway Discusses Crossing Accidents

C. W. Galloway, vice-president, operation, of the Baltimore & Ohio, the principal speaker at the convention, addressed the delegates at the opening of the Wednesday afternoon session, immediately following an informal luncheon at which Robert Scott, director of insurance and safety of the Atlantic Coast Line, acted as toastmaster. Like several of the other speakers, Mr. Galloway took the problem of the grade crossing accident as his central subject, repeating and emphasizing many of the figures and pertinent observations which he had presented to the Associated Traffic Clubs of America, meeting in Cincinnati, Ohio, on April 24, in an address which was reprinted in full in the *Railway Age* of June 21, page 1473, under the title of "Grade Separation—Is It the Solution For Crossing Accidents?"

The railroad plant, Mr. Galloway said, is so constructed—thirty feet wide in some places to several thousand in others and from 5,000 to 10,000 miles long—that the safety problem in connection with the railroad operation covers a wide stretch of territory. These problems may be grouped roughly into four classes: Accidents to passengers; accidents to employees; accidents to trespassers, and accidents at road crossings.

It is to the problem of grade crossing accidents that I especially wish to call your attention. The public has an incomplete right to the use of these crossings, perhaps a complete right to use them when not used by the railroad, but it is the indisposition on the part of the automobile driver to recognize our mutual rights that makes our problems so difficult of solution. We put up warning signs, wigwags, and flashlight signals and have crossing watchmen at busy cross-

ings; we sound our whistles and ring our bells. We do everything we can, except to stop the operation of the railroad to avoid these accidents and still they occur. This is not a railroad problem, primarily; it is a national problem and an association such as this, nation-wide and made up of leaders in our business and social life, should head the campaign to arouse the public to the enormity of losses and devise ways and means to check such criminal destruction of human life. Increased speed means increased hazards and the automobile drivers seem determined to go the limit at railroad crossings and road intersections.

After this introduction, the speaker cited figures showing that the number of people killed in automobile accidents in one year is greater by approximately 40 per cent than the total of all railroad passenger casualties, of any nature whatever, in 10 years, but that, serious as the grade crossing problem undoubtedly is, such accidents accounted for only seven per cent of the automobile deaths in this country in 1929. From these facts he drew the conclusion that:

It would, therefore, seem that the railroad grade crossing, about which we hear so much, is not the place to look for the correction of this trouble; yet, hardly an accident occurs at a grade crossing that there is not a great clamor from every direction, demanding the removal of the crossing, utterly disregarding the factor that should really have consideration, and that is—what is being done to insure a better supervision and control over those who are permitted to operate motor-driven vehicles. * * *

In the 1929 report of the Dean of the School of Law, Columbia University, contained in their bulletin of information, he points out that the automobile has raised new problems for the law, and adds that according to recent estimates more than 180,000 people were killed and over 6,000,000 injured in automobile accidents in the United States during the last decade, and concludes the particular paragraph in which this statement is made with this: "In any event, existing rules of law and the machinery for their administration are proving inadequate to cope with the situation." These figures are a serious indictment of our conduct.

The railroads are doing what they can, Mr. Galloway continued, to eliminate grade crossings, despite the fact that they must rely for funds wholly upon their earnings, and contribute by taxes to the state's share of elimination costs as well. Yet complete elimination is next to impossible, because of the prohibitive cost and the steady increase in new grade crossings, as highways are extended.

Automobile Drivers Unfit

At this point he again referred to his Cincinnati speech, stating that although actual observation of over 3,000,000 cases proved more than 13 per cent of all drivers to be careless or negligent in approaching railroad crossings, only 17 states—most of which are located in the East—had any drivers' license laws, or made any attempt to supervise the operation of automobiles on public highways. This is in spite of the fact that:

Traffic authorities are agreed that the enactment of drivers' license laws is one of the ways in which the country can combat its alarming toll of 31,500 annual motor vehicle deaths.

The figures we have been able to develop indicate that the average motorist is created in about 17 minutes, and they then undertake to drive a machine which can be operated at a speed equal to that possible with the average passenger locomotive, and which has no course to definitely guide it beyond that of the right of direction and, consequently, can be, and is, driven all over the highway at the will of the operator—quite a contrast with a passenger locomotive engineer.

I had taken from our files at random the records of 50 passenger locomotive engineers running our high-speed trains. From the time these men first entered the service in the apprentice capacity of student firemen until they first ran a passenger locomotive was 17 years. It did not, of course, require 17 years to qualify these men, but the fact remains they were that long in seasoning, running on tracks that guide them, under signals that, so to speak, talk to them, and under definite rules and closest supervision to see that they are obeyed, which is a typical situation. Therefore, when

you ride in a passenger train on our American railroads you have almost definite assurance of safety because of the qualifications and thorough seasoning and supervision over the fine body of men running locomotives, as against the inexperience and incompetence of motorists to which we constantly expose ourselves when on the highways.

If the locomotive engineer should fail to stop at a red signal, unless he had an exceptionally good record the penalty is dismissal. Although we have spent well onto \$1,000,000 to install flashlight signals for the protection of the motorist at highway grade crossings, we know definitely that these signals are frequently disregarded by the motorists. * * * These signals are operated through track circuits in the same general manner that the electric automatic signals governing the locomotive engineer are operated, and yet we accept without concern the disregard of these signals by motorists—a thing you would not stand for for one minute if it were done by the locomotive engineer. * * *

After comparing the "Titanic" disaster in 1912, when a single accident, resulting in the loss of 1,517 lives, produced immediate action making a repetition impossible, to the present situation, when little or nothing is done to prevent an annual loss of 31,500 lives in motor vehicle accidents Mr. Galloway concluded his address by saying:

There is such general apathy to this great problem that I felt this occasion offered an exceptional opportunity to present the subject to you and urge that you, in your various activities, give it your earnest consideration and attention with a view of developing a greater and more sympathetic interest toward promoting a better and more helpful supervision and control over those authorized to operate motor-driven vehicles on our highways. The safe operation of our railroads is ample evidence that it can, if properly handled, be done.

Education to Prevent Accidents

Although, as pointed out above, a number of different speakers stressed the value of constant education as a means of promoting safety, the leading address on this topic was delivered at the opening of the second session of the Railroad Section by P. E. Odell, vice-president and general manager of the Gulf, Mobile & Northern. His paper, on "Education—A Factor in Accident Prevention," read in part as follows:

Accident prevention is receiving the attention of the entire world as never before. People are awakening to the fact that great suffering and loss caused by accidents due to carelessness and thoughtlessness can be lessened or almost entirely eliminated by education. But, to obtain maximum results, activities in this direction cannot be carried on as a side issue. They must be given a place of paramount importance in the operation of a railroad. The best proof of this statement lies in the fact that, while the Gulf, Mobile & Northern had been making fair progress in reducing employee injuries from 1923 to 1927, through more or less routine methods and sporadic safety contests, our casualty rate had been reduced only from 30.89 to 12.02. In the early part of 1928, mass meetings were held at the important points on our line, at which the employees were assured that the management was in earnest in its desire that safety be given preferred attention. They have responded nobly, and our casualty rate was reduced to 3.15 in 1928, and to 1.68 in 1929.

In bringing about this reduction during the past two years, we adopted no revolutionary methods, nor any secret formula. It has been primarily a matter of education, along lines with which you are thoroughly familiar. * * * Every employee was advised of our relative standing among other roads, and these figures brought about forcible realization of the fact that we had a huge task before us if we expected to be a real contender in the National Safety Council contest. Each employee was designated as a safety committeeman. His foreman, supervisor, or trainmaster, was designated as chairman of the committee. Department heads were made vice-chairmen of the system safety organization, and the writer was designated as general chairman. A system of rating each safety chairman was inaugurated, and the standings are published monthly. These standings also included the cumulative figures for the year. Extensive instructions in safe practices became the order of the day. The chairman's safety record was given its proper place in determining his efficiency as a supervisory officer. Other methods have been employed, with which you

are all familiar, such as the use of bulletin boards, safety meetings, safety suggestions, etc.

Safety "Reminders" Essential

Doubtless you have all heard at one time or another that the subject of safety is being overworked—that the public is getting "fed-up" with safety talks, literature, meetings, etc. I have never been convinced that this is true. On the contrary, it is my belief that continual and unremitting efforts are essential.

The new man should, of course, be given intensive safety instructions, but as is often the case, the "old-timer" knows as much, or possibly more about the safety requirements of his particular job than does the supervisor. He, therefore, sometimes resents being told how to do this and how to do that. The proper way to educate him is through little reminders. Several railroads, ourselves included, have been placing a transportation rule on their bulletin boards daily. It is called the "Rule of the Day." Most of these rules are so well known to the "old-timer" that he can repeat them verbatim. He knows the necessity for the rule, and probably has religiously lived up to it. Yet, instead of his feeling that his intelligence has been insulted when the trainmaster asks him to repeat the "Rule of the Day," if he has the right stuff in him, he will show a little feeling of pride in being able to come right back with an intelligent answer—as if to say "Why don't you ask me something hard?"

It has been said that "most of us are past the point where we will listen to advice that is presented in text-book fashion. Those who would teach us must assume that we know something. We will listen to the homeliest advice if it is given us in the form of a 'reminder.' We are like children in the sense that we must be 'reminded' all our lives."

Through the earnest and conscientious efforts of you who are in charge of the safety departments of your respective railroads, there has already been created a decided change for the better in the attitude assumed by the "old-head" towards safety. He is not afraid to caution his fellow-worker to avoid chance-taking. Instead of adding to his own importance by relating to the new man how he had kicked drawbars all his life, how he has caught fast-moving trains, or the front foot board at top speed—in other words, how close he has come to accidents without getting scratched he is telling that man that these tricks are considered foolish in this day and age. I repeat that you gentlemen have had a large part in upsetting the old railroader's code that a stub finger or toe goes along with his job, and is a necessity before he is entitled to be called a real "he-man." Now, that is the result of the right sort of education.

But, after all, it has been truly said that "it is hard to teach an old dog new tricks." * * * Habit plays a very important part in our lives. As most habits are formed early in life, we decided that the safety habit, or "safety consciousness," as it has been frequently termed, could best be developed in the minds of our youngsters. About a year ago, we therefore organized the Gulf, Mobile & Northern Junior Safety Committee, which includes sons of employees between the ages of ten and seventeen. Subsequently, we extended the membership to include boys within these age limits, who are not sons of employees.

Mr. Odell here gave a description of the organization and work of the G., M. & N. Junior Safety Committees, which were fully described in an article entitled "Gulf, Mobile & Northern Interests Boys in Safety," published in the *Railway Age* of June 7, page 1370. Following this description he finished his talk by saying:

I am strongly of the opinion that no address on safety should be brought to a close without a suggestion from the speaker; therefore, I offer this one: That safety be taught in the schools in every state in the Union. I do not offer this as a new idea, because I am aware that some schools have already included this subject in their curriculum. In many such schools, excellent work is, no doubt, being done; but the methods employed, and the nature of the courses offered are not at all uniform.

Albert W. Whitney, vice-president in charge of education, of the National Safety Council, recently stated that "the strain upon the curriculum of the modern school is very great, and nothing can permanently find a place in it that does not make a genuine contribution to the development of the mind and character of the child." I believe education in safety is entitled to a very high place in this category. If it is absolutely necessary to choose between safety and some other course, I believe that safety should be given very serious consideration.

When our young people have been thoroughly instructed in

safe practices, and have developed a "safety consciousness" early in life, their safety habits will have become so firmly entrenched that they will be practically impossible of dislodgment. And when these youngsters take over the reins of industry, it is my belief that the results that have been accomplished thus far in the prevention of accidents, will appear almost trivial in comparison.

Accident Causes and Remedies

T. H. Carrow, superintendent of safety of the Pennsylvania, and chairman of the committee on causes and remedies of accidents, gave a comprehensive analysis of accident statistics for the first six months of 1930, as compared with corresponding figures for the same period in 1929. After pointing out that the number of persons killed in all railway accidents was 12 per cent less and the number injured 30 per cent less in 1930 than in 1929—the smaller reduction in fatalities being due to the fact that the figures include trespassers, motorists, and others over whom the railroad has no control—Mr. Carrow went on to analyze accidents by classes of people involved. Of the fatalities, trespassers accounted for 1,051, motorists involved in crossing accidents for 962, employees for 494, and passengers for only 21, reductions from 1929 of 2, 14, 21 and 48 per cent, respectively. In the case of non-fatal injuries, however, employees were most heavily involved, a total of 19,512 being injured as against 2,685 motorists, 1,562 passengers and 1,396 trespassers. Injuries to trespassers showed a slight increase over 1929, but injuries to employees were reduced by 35 per cent, those to motorists by 11 per cent, and those to passengers by 18 per cent. In commenting on these figures Mr. Carrow said:

It must be admitted that the reduction in business and the probable reduction in highway travel contributed to some extent to the reduction in highway crossing accidents. However, it is the belief of the Committee on Statistics that the work of the Committee on the Prevention of Highway Crossing Accidents, both of this section and the Safety Section of the American Railway Association, in educating the public to exercise care in approaching and driving over highway crossings has been a very large factor in the reduction. It is my personal view that the change in the locomotive whistle signal, which requires it to be sounded up to the crossing, and the more efficient use of this signal has also been a very important contributing factor.

Crossing accidents make up more than one-third of all fatal injuries and about 10 per cent of non-fatal injuries. This proportion makes the highway crossing accident situation extremely serious and one that merits full attention. There are few problems upon the railroad today which are giving and will continue to give more concern. One thing is sure and that is that no road should fail to give an effective highway crossing warning signal.

Trespassing accidents are a class over which the railroads have little direct control, although many roads have done excellent work in bringing to the attention of school children the dangers of trespassing on railroad tracks. This is a feature of accident prevention in which the public generally is largely responsible and in which most railroads have found they are willing to help when practical ways and means are pointed out.

Figures covering injuries to passengers are very misleading as they include not only accidents for which the railroads may be responsible, but those for which the passengers themselves are responsible. It should be pointed out that out of 21 passengers killed only one lost his life in a train accident, whereas 11 met death while getting on and off cars and six were struck by trains other than the one on which they had been riding. A similar proportion of the non-fatal injuries were attributable to the carelessness of the passengers themselves. In other words, *** the chances of passengers being killed or even slightly injured are infinitely less than in any other form of transportation, even less than walking on the streets and highways. *** Even such liability to injury on the part of passengers as may now exist is being constantly minimized by improved equipment, signaling systems and more efficient training and supervision of operating employees to insure the prevention of train accidents.

It is impressive to note that 47 per cent of all employees killed and 34 per cent of all employees injured were train and engine service men and this figure would be very disconcerting if it were not for the fact that the majority of these injuries are attributable to causes over which the injured employees have control and over which train service employees on certain railroads have actually gained control.

After concluding this part of his address with the statement that "It is scarcely justifiable to burden railroads with a presentation of ways and means of preventing accidents that they are already applying," Mr. Carrow continued with an analysis of causes of injuries to employees. Most of these, he found, were attributable to coupling and uncoupling cars and locomotives; operating locomotives, hand brakes and switches; coming in contact with fixed structures; being struck or run over; getting on or off cars and locomotives, and non-train accidents of various types. In practically every one of these classes there were fewer accidents in the first six months of 1930 than in the same part of 1929, the reduction in some cases running as high as 60 per cent.

This leads to the belief that:

Every single railroad in the country is applying the measures laid down by the Committee on Statistics at Salt Lake City in 1924, which are: (1) Improved design, construction, maintenance and installation; (2) Improved training, supervision and discipline, and (3) Safety organization, education, persuasion and co-operation.

Train Accidents

Exclusive of 76 train accidents at highway crossings and of all such accidents costing less than \$150 and therefore not reportable to the I. C. C., train accidents, as analyzed by the speaker, totaled 6,637 in the first half of 1930. This represents a reduction of 20 per cent from the 8,304 such accidents reported in the same part of 1929, while numbers of persons killed and injured in those accidents were reduced three per cent and 40 per cent, respectively. Derailments were the outstanding cause of train accidents, accounting for 3,881, while collisions numbered 1,568.

In commenting upon this phase of his subject, and before closing his paper with a brief review of the efforts to reduce train accidents now being made by the several railroads, Mr. Carrow said:

It is the view of the committee on statistics that the train accident situation is today about where the personal injury situation was four or five years ago, but that in the next year or so the same reductions in train accidents will be reported as have been effected in injuries to employees. In fact, there is some reason to believe that train accidents are easier to control than personal injury accidents and indeed there are being made at the present time some very gratifying records in this connection.

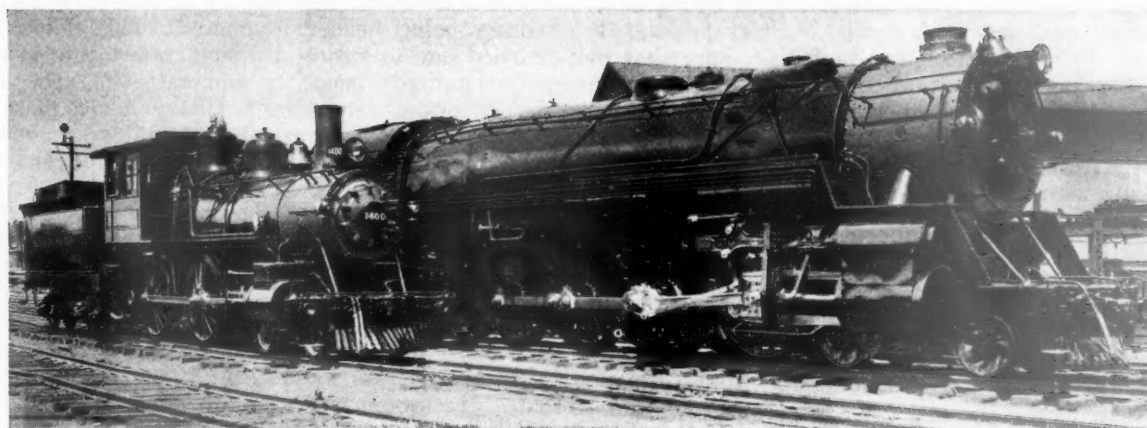
The Handling of Explosives

"The Work of the Bureau of Explosives in the Prevention of Accidents Due to Explosives, Inflammables, Etc.," was the subject of a paper presented at the first meeting by W. S. Topping, assistant chief inspector of that bureau. Following an historical sketch of the formation of the bureau, to enforce uniform rules in the transportation of explosives, in 1907, Mr. Topping reviewed its efforts to secure federal legislation (passed in 1908) and the co-operation of manufacturers of explosives in preparing and packing their goods, and then gave a detailed outline of the work now done by the bureau's inspectors.

Extracts from his address follow:

Safety in the transportation and handling of explosives and other dangerous articles depends very largely on the method of preparing and packing, whatever the nature of the article.

(Continued on page 762)



The Locomotives of Yesterday and Today

Traveling Engineers' Motive Power Symposium Concluded

*Addresses by S. G. Down, G. L. Bourne and J. E. Muhlfeld
feature afternoon session devoted to "The
Motive Power of Tomorrow"*

FOLLOWING the addresses by three locomotive builders and three railroad officers at the Traveling Engineers' Association symposium, "The Motive Power of Tomorrow," at Chicago, September 24, as reported in last week's issue, S. G. Down, vice-president, Westinghouse Air Brake Company, presented a prepared address in which he outlined the present status of numerous detailed improvements in air brake equipment and parts and indicated some of the braking problems which will have to be solved if schedule train speeds of 90 m. p. h., or more, materialize, as predicted by several of the previous speakers.

The paper prepared by G. L. Bourne, chairman, Superheater Company, was read by R. M. Ostermann, vice-president, and, as indicated in last week's issue, contained the prediction that increased steam pressures, higher temperatures and greater sustained power capacity will obtain in future locomotive designs, accompanied by a marked reduction in the amount of steam and fuel consumed per indicated horsepower-hour. J. E. Muhlfeld, consulting engineer, New York, also predicted increased boiler pressures, power capacity and operating speeds. Mr. Muhlfeld discussed the feasibility of a more direct all-rail line, 800 miles long, between Chicago and New York and involving the construction of less than 350 miles of new railroad.

Future Locomotive Air Brake Requirements

By S. G. Down

Vice-President, Westinghouse Air Brake Company,
Wilmerding, Pa.

My remarks will refer specifically to the air brake apparatus on the locomotive, which must not only provide

for the changes in the locomotive itself but also be capable of providing satisfactory control of the higher speeds and longer and heavier trains that the improved locomotive makes possible, and at the same time supply and utilize the compressed air in the most efficient manner.

The source of air supply, the compressor, has, during the past few years, passed through several stages of capacity and efficiency of output, and with the increased demand for compressed air not only for the operation of the brakes, but the ever-increasing use of air for auxiliary devices such as sanders, bell ringers, fire-door engines, reversing gear, ash-pan engines, grate shaker, cylinders, cylinder cocks, water scoops, etc., suggests the desirability of providing the greatest output of compressed air per pound of fuel used.

The most recent development of air compressor to meet the locomotive of the future with its high steam pressure and high degree of superheat has a greater efficiency than ever heretofore obtained. It is designated as the 7 $\frac{3}{8}$ -in. cross compound, and has the same displacement as the well-known 8 $\frac{1}{2}$ -in. compressor. 150 cu. ft. at 131 single strokes per min. against 140 lb. air pressure. The 8 $\frac{1}{2}$ -in. compressor operating on saturated steam of 99.5 per cent quality at 200 lb. pressure consumes 25 lb. of steam per 100 cu. ft. of air compressed, whereas the 7 $\frac{3}{8}$ -in. compressor, operating on steam at 250 lb. pressure, superheated to 650 deg. F., consumes but 16 lb. of steam per 100 cu. ft. of air produced—a saving of 36 per cent in steam consumption.

The 7 $\frac{3}{8}$ in. compressor is designed for a maximum steam pressure of 500 lb. and maximum steam temperature of 750 deg. F. It has a heavier cross section and is also constructed of a special alloy material called Wabcoloy to withstand safely the high pressures and

temperatures, and also provide for longer life and better wearing qualities.

Owing to the wide range in boiler pressure that the compressor has to meet and to provide for the proper speed irrespective of boiler pressure, a special hardened-steel choke is placed in the steam line of such size as to permit the recommended normal speed of 131 strokes per minute with maximum boiler pressure.

High Pressures and Temperatures Require Special Materials

The use of high steam pressure and temperature also calls for a special form of steam valve and compressor governor. The steam valve now developed to meet future needs has a steam body made of cast steel, a valve of Monel metal and a valve of stainless iron—special materials that withstand 500 lb. of steam pressure and 700 deg. of temperature. A new governor designated as a super-governor has been designed having special features to take care of the high pressure and the temperature. It has a steam body made of semi-steel and a stainless iron steam valve and stem to reduce the cutting effect of superheated steam. To prevent the high temperature from reaching the air portion of the governor containing the governor piston and valve, an air circulating space is provided between the two sections. With the development of the super-governor to take care of the high pressures and temperatures, certain improvements were also made in the air portion, but I will not attempt to describe these details at this time.

Locomotive boilers of the future may be of such size and weight as to warrant a reduction of weight in some of the accessories. Considerable study and experimenting has been carried on in the direction of using aluminum in the construction of the air-brake apparatus, particularly the main reservoirs and brake cylinders, but up to the present time without great success.

The more effective locomotive of the future will, no doubt, handle a greater number of cars and proportionately require a greater volume of compressed air. Therefore, special attention will necessarily have to be given not only to adequate air supply but to the elimination of the moisture from the large volume of air required. Experiments have been under way for some time with refrigerating apparatus for drying and purifying the air that may result in a successful development in the future. However, in the absence of such a device, the use of radiating pipe provided with fins increases the normal radiating efficiency of ordinary pipe about 60 per cent and is very desirable from the standpoint of reduced weight per unit of radiation and space occupied.

The actual volume of air in a 100-car train, assuming cars 45 ft. long, will be 188 cu. ft. To charge this train (assuming a tight brake) will require 1,066 cu. ft. of free air, and to recharge it after a 20-lb. brake-pipe reduction will require 250 cu. ft. of free air. With a 150-car train under the same conditions, it will require 1,600 cu. ft. to charge and 375 cu. ft. to recharge.

The increased volume of air required for the train of the future will be adequately supplied and uniform pressure maintained by the use of the new and large capacity Type M feed valve. This valve has a capacity to flow 100 cu. ft. per minute, when maintaining a pressure 5 lb. below its setting, as compared to 40 cu. ft. of air per min. with the former standard valve.

The handling of such increased volume of air through the brake valve resulted in the development of a valve having a large rotary which necessarily meant a very

large body and longer handle to operate it owing to the rotary being harder to operate. This device was discarded due to size and difficulty to locate in the somewhat limited space; to eliminate the necessity for a larger brake valve, an auxiliary device has been developed and placed at a convenient point in the brake pipe close to the brake valve, which device is designated as the emergency relay valve.

Car Valve Designs Also Being Modified

The air-brake requirements for the greater number of cars handled by the locomotive of the future cannot entirely be met by modifying the apparatus on the locomotive. The greater volume of air necessary to be discharged from the 150-car brake pipe must be taken care of through some modification in the valve structures on the cars, and this is being provided for with modern apparatus now under test.

With large boilers limiting cab space and in harmony with the general trend towards a compact and simplified arrangement of all apparatus on locomotives, a brake-valve pedestal was developed which, in effect, is a combined pipe bracket and supporting means for both the automatic and independent brake valves as well as the feed valve, reducing valve, emergency relay valve, and cut-out cock. This pedestal provides a rigid support for all of the devices mentioned and reduces to a minimum the number of pipe joints with their attendant leakage. Moreover, it greatly improves the general appearance of the cab and reduced maintenance expense.

Locomotives of the future will, no doubt, be operated in continuous service for a greater number of miles than at present, which is in the direction of economy. However, to insure this much desired and efficient performance, extra precaution will be required in the installation and piping of the air-brake devices.

The development of locomotives in recent years has all been in the direction of increased weight and a progressive reduction in space available for the location of the brake cylinders and foundation brake equipment. Consideration has been given to the use of special alloy steel with a view of reducing weight and providing sufficient clearance. Up to the present time, it has been found possible by special designing to avoid the use of alloy steel with its increased cost, but it is possible the locomotive of the future may require the use of alloy steel throughout the foundation brake parts.

It is quite possible the locomotive of the future will be so limited in space for the location of driver and trailer wheel brake cylinders that small diameter cylinders will be used requiring the employment of a relatively higher brake-cylinder pressure than at present. To meet this situation, a distributing valve has been developed that will provide for a higher locomotive brake-cylinder pressure per pound of brake-pipe reduction; this is accomplished by the use of a differential application piston, resulting in a uniform ratio of braking between the car brake cylinders and the locomotive brake cylinders irrespective of the differential in cylinder pressure obtained from a given reduction.

The foregoing outlines briefly some of the air brake improvements now available for the "Motive Power of Tomorrow".

Sustained Power Capacity Is Predominant Need

By G. L. Bourne,

Chairman, The Superheater Company, New York

Before speaking of the motive power of tomorrow, may we, for a moment, consider the motive power of

the past, as well as of the present, in order that the background on which the future motive power is to be measured may be made somewhat more definite?

The motive power of yesterday was a locomotive which served well the needs of the period prior to the turn of the twentieth century. It was, however, under-boilered, but this weakness was not so keenly felt because the requirements for sustained capacity were not then predominant. The locomotive of this period required 28 lb. of steam and 4 lb. of coal to produce an i. h. p. hour.

To build a locomotive, using the yard stick of 1905, which would meet the present day requirements of sustained capacity, would be a practical, if not a physical impossibility, even though advantage was taken of the increased wheel loads which are now permitted. This imaginary locomotive, using saturated steam, could only increase in length since width and height limitations have remained practically the same. It does not require much study to recognize that such a locomotive would in reality, be a white elephant on account of the limited field of operation, but also because of the high first cost and operating expenses involved. The use of superheated steam increasing both boiler and cylinder efficiencies, marked the division between the past and the present.

The motive power of today is a high-capacity locomotive. Its boiler is the elder brother of that in the motive power of yesterday, and embodies, for a given sized unit, an increased sustained output of not less than 30 per cent resulting from the adaptation of the fire-tube superheater. This has made possible the large increase in drawbar horsepower at higher speeds required for the operation of our railroads.

This continued demand for still higher sustained horsepower fully utilized the increased boiler capacity obtainable from the Type A superheater, and in recent years, further increases in boiler and superheater capacities were demanded. High rates of evaporation, decreased steam space between wrapper and crown sheet, and other changes, brought about a condition where a greater percentage of the available gas area through the boiler had to be utilized in order that the superheater could deliver the increased degree of superheat which was being required, and at the same time overcome the obstacles imposed by entrained water, sometimes amounting to 15 per cent, in the steam which it had to handle. To meet this condition made necessary a considerable amount of development work in order that a greater superheating capacity, with a minimum sacrifice of evaporating surface, could be obtained with a practical device. This involved a better use of the cross-sectional gas area through the boiler, and a uniform steam section through the superheater. These are characteristics of the Type E design which, during the past few years, has been so widely used. This has increased the capacity of the boiler still further so that the locomotive of today meets the severe conditions and produces, an indicated horsepower-hour for less than 16 lb. of steam and $2\frac{1}{2}$ lb. of coal.

This performance has been made possible through the coordination of boiler and superheater.

Greater Reserve Boiler Capacity Forecast

The motive power of tomorrow will be a locomotive having horsepower capacity at speeds equal, at least, to the locomotive of today, and it will have a greater utilization of adhesive weights. It will have a boiler with a greater reserve capacity than the present-day design.

Effective locomotive power has always been governed by boiler capacity, and practically all boiler changes

have aimed at increasing this. When the problem is stripped to its fundamentals, we find that development is in this item.

Looking back over the perspective of the past quarter century, we gain interesting impressions of what has taken place in the development of the steam locomotive. This period embraces the practical introduction and successful development of the use of superheated steam; the successful application of the locomotive stoker and of feedwater heating; the use of higher grade materials, permitting saving in weight, and a multitude of other improvements which have contributed to the longer locomotive runs at higher speeds and with heavier trains. All of these factors have played their part in giving to the railroads a more effective motive-power unit.

Increased steam pressures and higher degrees of superheat have been contributing factors in making available the higher sustained capacities demanded by present-day operation. With full appreciation of the hazards of prophesy, there is no hesitation in expressing the belief that the next quarter century will witness even more pronounced increases in both steam pressures and steam temperatures, than in the recent past.

There is every reason to expect in the near future, a marked reduction in the amount of steam and fuel used per indicated horsepower-hour, since the path for still greater increase in steam pressure and in steam temperature, has been blazed by the engineers of industrial plants, as well as by our locomotive builders and railroad companies. It is increasingly evident that higher steam pressures do not involve greater maintenance problems than had been assumed prior to the world war as being the inevitable result of increasing the working pressure. Within the past five years locomotives have been placed in operation with working steam pressures up to 1,200 lb. per sq. in., in which a number of different boiler designs have been used. Reciprocating engines, as well as turbines, have been used for prime movers. It would be rash to claim that the high pressure turbine locomotive will not, at some time, be developed to a point where it is a reliable and economical form of motive power. Up to the present time these turbine locomotives, have, from necessity, been made with condensers requiring expensive and complicated construction. Recently however, proposals have been made to use a non-condensing turbine on a locomotive, and one or more units are building for a foreign railroad. Locomotive men await with interest the service results of these engines.

Future Design May Involve Radical Changes in Appearance

The motive power of tomorrow, with higher steam pressures will, without much doubt, be considerably changed in appearance and its boiler quite probably, will be radically different from the conventional type of today. Steam pressures up to 300 lb. per sq. in. have been used on locomotives having the staybolted type of firebox, and it is probable that trials will be made with boilers of this type carrying somewhat higher pressures. My impression is that the general opinion, both here and abroad, tends towards eliminating flat stayed surfaces when pressures above 250 lb. per sq. in. are considered, and substituting a boiler structure that will have tubular members throughout, or at least, in that part of the boiler where high gas temperatures are encountered. In this country pioneer work in this direction has been done by The Baldwin Locomotive Works, The Delaware & Hudson, and the New York, New Haven & Hartford. Water-tube fireboxes are now be-

ing constructed for the New York Central and for the Canadian Pacific. With the exception of the last two railroads mentioned, the water-tube fireboxes have been part of a single-pressure generating system, that is to say, the entire steam generator has carried but one steam pressure. The locomotives of the Canadian Pacific and the New York Central represent another line of development in which there are, in reality, separate steam generating systems carrying working steam at two different pressures. This design is embodied in locomotives working in England and on the Continent. All the evidence obtained is to the effect that a much higher operating efficiency is obtainable as contrasted with the normal type of locomotive in use at the present time.

The locomotive of tomorrow, will, in my opinion, be an engine at least as powerful as our present-day locomotives built within the same height and clearance restrictions. It will have a boiler that will overcome the present deficiency in steam space and it will not make necessary the superheater being used, in part, as an annex of the boiler. It will be of such a design as to handle the miscellaneous waters that our railroads have to use in their locomotives. It will operate without boiler-water troubles, over longer continuous runs than it does today. It will use steam at as high a temperature and as high a pressure as available materials will permit. It will have a much better cylinder efficiency as a result of greater temperature range and decreased cylinder volume. It will have a greater refinement in machine design and will be maintained at a reasonable cost and with less time out of service. It will, as a whole, I believe, be at least 20 per cent more efficient than the locomotive of today.

If we can do this, the motive power of tomorrow will take care of itself for sometime to come and our transportation friends can still further improve the wonderful records they have made during the past ten years.

The Steam Locomotive the Greatest Transportation Machine

By J. E. Muhlfeld

Consulting Engineer, New York

(Before attempting to discuss the subject of future locomotive requirements, Mr. Muhlfeld reviewed present conditions and accomplishments in the transportation field and analyzed the probable demand of the public, with particular reference to speed, convenience and safety. He described some of the results achieved with three high-pressure locomotives on the Delaware & Hudson and discussed the advantages as well as limitations of electric and internal-combustion locomotives. Mr. Muhlfeld's comments regarding the possibility of an 800-mile line and 11-hour schedule between Chicago and New York, also the general conclusions drawn in his paper, are as follows:—EDITOR.

The Middle West has never had a railroad scientifically planned to connect it directly with the Atlantic Seaboard. Existing railways were constructed at a time when no one believed they would ever be able to compete with the waterways. They were, therefore, built where the canals could not be easily constructed and later carried on through to New York.

The arc of a great circle, or an air line, between Chicago and New York measures 742.6 miles, and with the construction of less than 350 miles of new railroad, which is no more than the distance on the Virginian, from Princeton in the West Virginia coal fields to

Hampton Roads at tide water, an all-rail line between these two largest cities in the United States can be reduced to an 800-mile run with 0.3 per cent ruling grades against the eastbound traffic. As four tons of traffic comes from the Middle West to the East, for each one ton that moves West, the traffic movement could be balanced with higher westbound grades. In this way and with an 800-mile line between Chicago and New York, there is no reason why passenger-train service cannot be established which will enable a person to sit down to dinner in this hotel at seven o'clock this evening, depart on a train at eight o'clock and arrive at a hotel in New York tomorrow morning and sit down to breakfast at eight o'clock, after a safe, comfortable and quick 11-hour trip.

Inherent Advantages in Steam Motive Power

The steam locomotive is the greatest and most useful of all human transportation machines and, although it is still an infant, it is remarkably well adapted to the requirements of rail service because it has direct drive, can be started under full load and carry a heavy overload, and has great flexibility as regards both power and speed. It is also relatively simple and cheap, and the principal deficiency, which has been its rather low thermal efficiency, is now in the process of adjustment.

In ten years from now it will be much changed and improved and in 25 years it will be even harder to beat than at present.

Therefore, with the rapid development now taking place in railroad motive power in steam, as well as in oil, engines of the self-contained, self-propelled type, which are eliminating more and more the smoke, cinder, gas and noise nuisances, it will seem somewhat out of order for a railroad to embark on an expensive electrification program for the handling of heavy tonnage over long distances. Even in high density passenger traffic or terminal districts or where tunnel and other special conditions obtain, it may be that self-contained oil and oil-electric types of locomotives and motor cars will answer all the requirements of electrification, with substantial savings in investment, operating and maintenance costs for both the roadway and the equipment. The fact that the New York Central has not in 20 years extended its original New York Terminal electrification and is now trying out improved types of self-propelled oil and steam motor cars, I think justifies this statement.

Automobile speedway records will now average, for runs of from 5 to 10 miles, between 150 and 160 m. p. h., and for runs of from 10 to 300 miles, between 135 and 140 m. p. h. No one but the traffic officers think anything of driving an automobile on the regular highways at 60 m. p. h. Is there any reason why trains operating on tracks should not double that speed? Having operated saturated steam locomotives many years ago at speeds of 85 m. p. h., I would answer "No", provided we have a suitable roadway with low grades and light curvature over which to run. I think I recognize several locomotive engineers in this gathering who would be willing to tackle the job, even though they may be in their "late thirties."

Train Rear Ends May Have To Be Stream-Lined

On level track, a sustained speed over long distances of 70 m. p. h. is good performance for the design and efficiency of modern conventional steam locomotives; 80 m. p. h. is rare and 90 m. p. h. is unusual. The reason for this is not the high r. p. m. and piston speed and cylinder back pressure of the machinery, nor the courage or endurance of the engineers, but the resistance

due to the suction action at the rear end of the train and between the cars. Until the rear ends of the observation or tail-end cars in the high-speed trains are given a stream line and a pointed stern, the suction drawback or pull which now obtains will tend to make it difficult to attain sustained speeds of over 90 m. p. h. with any steam, electric or internal-combustion-electric type of locomotive that can be designed.

It is perfectly feasible to design a 4-6-4 type locomotive with a rating of 50,000-lb tractive force for speeds of from 100 to 125 m. p. h. and make use of the "James Archbald" design of high-pressure boiler which will enable a sufficiently low vertical center of gravity in combination with 96-in. diameter driving wheels, about 30-in. stroke and a modified Uniflow system of valve and cylinder arrangement. Such a locomotive with 96-in. diameter driving wheels and 30-in. stroke, running at 125 m. p. h., will have no greater piston speed than the present-day conventional locomotives with 74-in. diameter driving wheels when operating at 65 m. p. h. A poppet valve and a rotary valve gear might be useful to increase the cylinder indicated horsepower by means of quicker steam admission and exhaust openings, smaller clearance spaces, reduced cylinder back pressure and the elimination of drifting valves.

With high-pressure boilers, such as are now being used on three Delaware & Hudson freight locomotives, the center of gravity of a locomotive with 96-in. diameter driving wheels can be kept down to 80-in. from the top of the rail which will admit of negotiating a 1-deg., 40-min. curve, with a super-elevation of 8 in. at speeds of from 100 to 125 m. p. h., and on the heavier curves the train speeds can be held down by momentary brake applications in conformity with present practice.

Adequate Braking Power Must Be Provided

In order to reduce the speed of a train from 100 to 80 m. p. h., twice as much energy must be destroyed as is necessary to decrease the speed of the same train from 55 to 35 m. p. h., the average speed in the first case being 90 m. p. h., and in the second case 45 m. p. h., the former being two times the latter. However, the number of wheels to which brakes can be applied on a locomotive and cars in a high-speed passenger train, the weight carried by those wheels, the coefficient of friction between the wheels and the rails, the use of a clasp type of brake will enable the making of emergency applications and quick speed reductions and stops without sliding the wheels.

With respect to freight-train service on a low grade, a high-speed, high-powered freight locomotive of the 2-10-0 or 2-10-2 type, with 75,000-lb. driving-axle load, in combination with 500-lb. boiler pressure and 69-in. diameter driving wheels, can be designed to develop from 85,000 to 100,000 lb. tractive force. For such service, multiple expansion by means of a compounding or a modified Uniflow cylinder arrangement would be suitable, efficient and economical.

Before closing and while I still have you under steam, I should like to say something about general railway and the general railway and business situation.

Since the Great War, the steam roads in the United States have made remarkable progress in increasing the capacity of the existing railway systems with steam motive power and with little increase in main line trackage. This improvement has been brought about not only through steam motive power, but by the extension of locomotive runs and the more extensive use of automatic signals and mechanical train dispatching and by more efficient supervision and better maintenance. For

example, automatic block signals which were appropriate for certain lengths, weights and speeds of freight and passenger trains, are entirely unsuitable for the length, weight and speed of trains that can be handled by even the existing more modern steam locomotives.

Therefore, my conclusion is that the governing factor in the operation of higher speed and longer and heavier trains is not electrification, but shorter main lines; lower grades, lighter curves; stronger bridges and track; highway separation; mechanical train dispatching, automatic train control and relocation of automatic block signals in combination with improved steam locomotives and train braking. Electrification or unsuitable and inefficient roadway conditions will not improve long haul heavy tonnage service or reduce transportation expenses. And the railroads can get money to make necessary improvements only by improving their credit through earnings. They have not yet been permitted to earn the fair return assured them under the Transportation Act, and, in our recent drought, they were the first ones called upon to move urgently needed food-stocks and other materials and supplies in, and live stock out, of the drought-stricken areas at freight rates reduced 50 per cent below the already low tariffs.

Some Comments on Employment, and Taxation

The world is now in a period of business recession, economic slumps, unemployment, crime and revolutions. President William Green, of the American Federation of Labor, deserves great credit for condemning the demoralizing and paternalistic dole system and for advocating the stabilization of industry by more scientific and economical distribution of work, as a substitute for the cyclical over-production and depression, by means of shorter working days and weeks, in order to overcome recurrence of periods of depression. The majority of labor will give a full day's work to enable capital to secure a reasonable monetary return. Employers and employees should not be relieved of their sense of responsibility in these matters, but should become partners and co-operate to increase purchasing power to the maximum. Likewise, scientific, restrictive and selective immigration gives the same protection to labor as a protective tariff does to industries, and is one of the life savers of our economic life. Had this been in effect 50 years ago, we would have no unemployment, farm problems, racketeering or underworld conditions of the magnitude that we now have on our hands.

The forces that make for equilibrium are now active and, when consumption and production reach equilibrium and prices stabilize or begin to rise, business recovery is on its way. There is now a more cheerful feeling and a strengthened tone of confidence on account of generally improving business, domestic as well as foreign, which may be seen in the moderate but steady increase, week by week, in car loadings and in export shipments.

It is, therefore, not safe to assume that there will not be an increased demand for transportation facilities, or that the saturation point in our populous sections will not be reached in the near future, even though the man who plans ahead of his time is usually damned by his contemporaries. Furthermore, a dollar spent for the necessary new, and for the improving of our existing, railroads will certainly give more work to our unemployed, more assistance to our agricultural and natural resources and more advancement to the nation's industry than the expenditure of two or three dollars of our money for other purposes outside of our country. The New Jersey highway improvement program was to take

care of the peak of travel until 1950, but the New Jersey engineers have now found that the estimated peak has already been reached, 20 years ahead of time, and that it must prepare a new program. This reminds me of some of the locomotive designers' estimated weights, and of the railway mechanical department estimated expenditures.

One of our major economic problems, which deserves the serious attention of every taxpayer, is the continually increasing taxes which are getting a stranglehold not only on the railroads but on industry and business in general. Of every dollar of corporate net profit, about 30 cents is required for tax payments.

In 1929, every person who paid one dollar to a railroad for passenger or freight service paid 6.3 cents of it for taxes and, during the same year, the Class I railroads paid out \$402,630,000, or 6.3 per cent of their total receipts, or 23 per cent of their net operating revenue, in direct taxes, or over \$3.25 for every man, woman and child in the United States. No nation, year in and year out, can possibly survive by devoting 20 per cent of its income to taxes, and the railways are now in that position and at the same time up against a constant demand for the lowering of freight and passenger tariffs. The comedy in this situation is that the railway taxes are used for building highways so that motor busses and trucks can intensively compete with the steam carriers.

Hearings in Lake Cargo Coal Rates Case Held at Chicago

HEARINGS in the lake cargo coal rate controversy were opened at Chicago on October 6 before Examiner T. M. Bardwell. The rate controversy involving the relationship between rates on bituminous coal from the southern and northern coal fields to Lake Erie ports for trans-shipment, has been before the commission in various forms since 1912 and has been variously decided by the commission at different times. Complainants allege that the present rates from the Pennsylvania and Ohio fields subject those districts to undue and unreasonable prejudice and disadvantage as compared with the rates from the southern district fields in Virginia, West Virginia, Kentucky and Tennessee.

The rates from the southern fields, since January 1, 1929, have been 35 cents per ton higher than the rates from the northern fields. The 35-cent differential was arrived at by a compromise between the railroads serving the northern and southern fields after the commission had ordered a reduction in the northern rates, and after the southern roads had made a 20-cent reduction, which re-established a 25-cent differential. In the present hearing, which is a petition of the western Pennsylvania and Ohio coal operators to re-open the case, the allegation of unreasonableness made in previous cases is omitted, but an effort is made to have the commission deal with the question of relationship. The commission is also asked to invoke its maximum or minimum rate powers in prescribing the rates. In 1925 the commission held that the rates were not unreasonable, but in 1927, after further hearing, it ordered a reduction from the northern fields. The case was made a political issue in Congress and was also taken to the Federal court, but the Supreme court held it to be moot after the compromise rates were put into effect.

In April, 1930, roads serving the southern coal districts filed a motion to dismiss the complaint filed by the Ohio and Pennsylvania district coal operators in March, asking for oral argument on their motion and asserting that the complaints are insufficient in law because it will be shown that complainants are not injured by reason of the rate relationship complained of, the rates from the southern district, which are alleged to be unduly preferential, being higher than the rates from the districts in which complainants are located. In May, the commission denied the petitions of the railroads serving the southern coal districts and assigned the case to a hearing at Washington on June 16 before Examiner Bardwell.

At the Chicago hearing, which will probably last two weeks, B. C. Ackerman, a rate expert at Chicago, testified for the northern operators on the first day. His testimony was designed to compare the rates of the southern and northern districts, to contrast the performance of the various railroads in handling coal, and to compare the coal shipments to the ports and the ore shipments returning on the various railroads. His exhibits also showed that while the coal shipments to port were approximately equal to the ore shipments returning in the northern district, the return shipments of ore in the southern coal district far exceeded the shipments of coal to the ports, thereby eliminating any expense of back-haul.

F. M. Whitaker, vice-president in charge of traffic of the Chesapeake & Ohio, testified on the second day. A further spread in the relationship of rates from the southern district as compared with the northern competing districts would work an unjust hardship upon the operators located along the Chesapeake & Ohio, he said. According to Mr. Whitaker, price is the ruling factor and a difference of 25 cents per ton in favor of the northern fields is a handicap that cannot be overcome except by some extraordinary and unusual condition. With approximately equal production costs, an increased difference in the rates between the northern and southern districts would eliminate the competition of the southern districts for this lake cargo coal.

Since the commission's final report upon reconsideration of the 1925 lake cargo case of May 9, 1927, he said, the measure of the differentials from both the Southern high and low districts has been substantially increased, thereby affording the complainants a still greater absolute advantage in the relationship of rates than was in effect when the commission found that the smaller differentials did not result in undue preference or prejudice. In another portion of his testimony he said that coal moves when business is light and it is of importance to the operators that the commission does not disturb the present situation. It was his opinion that any change would cause a general depression in the economic situation, not only in the coal fields but in every other business in the territory served by the Chesapeake & Ohio. He contended that there is no undue preference or prejudice in the present relationship of rates from the northern and southern districts.

MORE THAN 300 PERSONS attended the third annual reunion of the Kansas City Southern veteran's association, an organization of employees of the road who have had a continuous service of not less than 25 years, at Forth Smith, Ark., on September 20.

M. H. Cahill Succeeds C. Haile as President of M-K-T

*Chairman of board of directors elected October 7
as Mr. Haile retires at his own request*

MH. CAHILL, chairman of the board of directors of the Missouri-Kansas-Texas, was elected president at a meeting of the board on October 7 to succeed Columbus Haile, who retired at his own request. Mr. Haile was designated by the board as president retired and will continue to serve as a member of the board. H. E. McGee, executive vice-president, was elected a director to succeed C. E. Schaff, resigned, while R. S. Reynolds, president of

66.84 in 1929 as compared with 69.33 in 1924. This improvement has occurred while transportation expense has decreased and while the maintenance of way and structures costs each year have been larger than in 1924.

Mr. Cahill is familiar with the problems of the Missouri-Kansas-Texas, having served as chairman of the board for the past two years. He was born at Lexington, Richland County, Ohio, on November 19, 1874, and first entered railway service in 1891 with the Bal-



Columbus Haile



M. H. Cahill

Selected Industries, an investment holding company, was elected a director to succeed Harry S. Black.

In selecting Mr. Cahill the Katy places itself in a decidedly favorable position since it will benefit from Mr. Cahill's 39 years of operating experience and at the same time will retain in an advisory capacity the valuable services of Mr. Haile who has been associated with the traffic department for 41 years. As president, chairman of the board and chairman of the executive committee, Mr. Cahill will be in charge of a property which is in good physical condition, is operating efficiently and is earning money, the earnings per share of common stock being \$5.10 in 1929, \$4.62 in 1928, \$4.80 in 1927, \$5.33 in 1926, \$5.33 in 1925 and \$4.72 in 1924. These earnings have been accompanied by a decrease in the operating ratio which amounted to

timore & Ohio. From this position he advanced successively until 1920 through the several posts of operator, dispatcher, trainmaster, assistant superintendent, division superintendent and general superintendent of the Pennsylvania and Maryland districts. This entire service was with the Baltimore & Ohio, except for a short time when he served as superintendent of the Buffalo division of the Delaware, Lackawanna & Western. In March, 1920, Mr. Cahill was appointed general manager of the Seaboard Air Line and continued in that capacity until June, 1922, when he became vice-president in charge of operation of the same road. In April, 1928, Mr. Cahill's request for a leave of absence from his duties on the Seaboard was granted and when he resumed active railway work in the fall of that year he became associated with the M.-K.-T. as chairman of the board.

Mr. Haile's retirement marks the close of the long and able service of a veteran officer of the railroad. He was born at Carlowville, Ala., on September 8, 1867 and was educated at Hampden-Sydney College and at the University of Virginia. He entered railway service at Dallas, Texas, on October 1, 1880, and was appointed assistant general freight agent of the Missouri, Kansas & Texas at Sedalia, Mo., in 1889. From 1891 to 1896, he was general freight agent and from June, 1896, to May 15, 1897, a member of the board of administration of the Southwestern Traffic Association. He was made freight traffic manager in 1897, traffic manager in 1898, and from February, 1907, to September, 1915, was also vice-president.

When the railway went into receivership in the latter year he became chief traffic officer and during Federal operation of the railways he was traffic manager of both the Missouri, Kansas & Texas (now the Missouri-Kansas-Texas) and the St. Louis-San Francisco. He was made vice-president in charge of traffic when the Missouri-Kansas-Texas came out of receivership, which position he held until his election as president in December, 1926.

Accidents Investigated in April

THE train accidents investigated by the Bureau of Safety, Interstate Commerce Commission, in the month of April, 1930, totaled five; two collisions, two derailments and the wrecking of a motor bus. The latter, causing the death of 22 persons is included in the derailments of trains. Following are abstracts of the reports of the commission.

Gulf, Colorado & Santa Fe, Alvin, Tex., April 9.—Northbound passenger train No. 14 of the St. Louis, Brownsville & Mexico, standing at the station, was run into by passenger train No. 16 of the same road, and the engineman and one brakeman of No. 16 were killed; 26 passengers and three trainmen injured. Responsibility is placed on the conductor and flagman of No. 14 for failing to provide proper flag protection. The flagman claimed that he had thrown off a 10-minute fusee more than a mile back, but the inspector doubts this testimony and concludes that if a fusee was thrown off it had been burned out before the arrival of No. 16.

Atchison, Topeka & Santa Fe, Isleta, N. Mex., April 11, 9:27 a. m.—Westbound passenger train No. 7, consisting of four mail cars, five express cars and one coach, hauled by locomotive No. 371, moving at about 45 miles an hour, ran into a motor bus at a crossing, and the front truck of the locomotive was derailed; the motor bus was demolished and the driver and 21 passengers were killed; seven passengers injured. The motor bus had been driven on to the track directly in front of the train but, the driver having been killed, there is no explanation of his neglect. Just before reaching the crossing he turned his bus sharply to the left and stopped it on the track some distance outside the crossing. Apparently he had seen the train too late. There was a good view. The driver was classed as an experienced man. There was some evidence that there was a woman riding on the seat with him and that he had been talking with her and also that his motor had stalled on several occasions when he was trying to start the vehicle.

Chicago & North Western, Janesville, Wis., April 25, 7:45 p. m.—An eastbound freight moving at low speed collided with a switching freight moving westward, also at very low speed, and one employee was killed

and one injured. The switching freight had been allowed to move westward against the current of traffic by a telephone message between the conductor who was at the Belt line cross-over and a switching tender at the Five-Points cross-over, 1¼ miles west; but notice was given to the switch tender that the switching had been completed and the main track cleared before such was actually the case. There were two engines and two conductors involved in the switching movement and the two conductors did not act in unison. The testimony is conflicting as to when the telephone messages were conveyed and as to what persons used the telephone. It appeared that on some occasions of this kind the block had been released before the switching movement was completed; and the principal recommendation of the report is that the proper officers of the road should immediately see to it that no difference in understanding exists. It is also noted that this word-of-mouth blocking by telephone is carried out between points more than a mile apart while there is a cross-over between the two points where it would be possible for an unauthorized train to enter the block.

Nashville, Chattanooga & St. Louis, Bell Buckle, Tenn., April 26.—A southbound freight train moving at about 25 miles an hour was derailed by a broken truck and two trespassers were killed. The failure of the truck was due to a defective arch bar which permitted it to drop so that when the car encountered a switch it ran over the track.

Reading, Merkle, Pa., April 29.—Eastbound freight train extra 1502, consisting of two loaded and 31 empty cars, and one caboose, hauled by locomotive 1502, running tender first, was derailed on a straight line, while moving at high speed, and the tender and locomotive were overturned. The engineman, the conductor and one brakeman were killed and the other three trainmen were injured. All of the six were riding on the locomotive, except the fireman. The maximum allowable speed on this part of the road for locomotives running backward is 15 miles an hour, but the inspector concludes that the speed was very much higher than this. The train had just passed over a steep descending grade without steam being shut off and without any application of the brakes.

* * *



On the Champlain Division of the Delaware & Hudson at South Junction, N. Y.

Reciprocity Investigations Enter Second Week

*Rail executives called to explain stand on purchasing—
New angles to traffic influence appear*

SINCE the Interstate Commerce Commission began its hearings on reciprocal buying in Chicago on September 30, officers of the Chicago, Rock Island & Pacific; the Chicago, Indianapolis & Louisville; the Chicago, Burlington & Quincy and the Atchison, Topeka & Santa Fe, as well as those of the Chicago & North Western, have been questioned regarding the use of traffic by shippers to influence railway purchases and the use made by the roads of their purchases to influence the routing of traffic. These roads have been selected, it is said, as representative carriers in the region, and not necessarily because any specific complaints were made against them.

H. W. Beyers, vice-president in charge of traffic of the North Western, followed E. A. Clifford, general purchasing agent, on the stand, and defended reciprocity both as a "perfectly natural and necessary relationship" and also as a "sound business principle." A close contact is maintained with the purchasing department, he said, and the purchasing officer understands that when he can secure a car of freight he should do so. He gave it as his opinion that price, quality and service of purchases must be protected, however, and said he would consider it rebating to pay a premium to shippers. Mr. Beyers was then questioned regarding correspondence disclosing that, at the request of the Edward Hines Lumber Company, the road had held on its line for several months cars purchased by the lumber company and solicited traffic with which to ship these cars under load to destination for the alleged purpose of saving the lumber company freight and other charges on the cars.

It was brought out in connection with extended negotiations between the North Western and a lumber company that confidential disclosures made to one "friend" of the low bidder's prices leaked out to another "friend" not so favored, resulting in a letter in which the assistant traffic manager of the road said to his agent: "If, in our effort to keep our friends, we are considered 'Jews,' we had better change our tactics, giving everyone a chance to bid and then making the purchase from the lowest bidder, regardless of our general relations."

In another instance, the effort of the purchasing department to co-operate with the traffic department by asking for bids from certain small mills resulted in prices being offered which caused another "friend" to retaliate by routing traffic against the road and caused the freight agent to write:

"I appreciate now it would have been better if I had not asked to have name put on the list of bidders Lately he has been getting so much of our lumber (orders) that he has not been shipping very much material besides ours, which works, of course, to our disadvantage."

During the questioning of Mr. Clifford, it developed that as a result of awarding contracts for lubricating oil to the Texas and Standard Oil companies, the Sinclair Company changed the routing of its traffic, because

the "matter of purchases," according to the road's traffic department, "is a tender spot with the Sinclair Company."

While the North Western was under contract with Johns-Manville for all its asbestos and magnesia requirements, the purchasing department was notified that the Philip Carey Company "were diverting all their competitive traffic, due to our placing purchases elsewhere." Later the traffic department reported that the Keasbey & Mattison Company was threatening to divert all traffic and asking for "one or two small orders immediately." Both companies got some business.

Before being excused, Mr. Clifford and Mr. Beyers were questioned concerning negotiations with the Pursglove Coal & Dock Co. over the purchasing agent's recommendation to buy certain tonnage of coal which was offered by that concern cheaper than the prevailing price and the subsequent failure to buy the coal because the local agent recommended that "we owe nothing to the Pursglove people." Mr. Clifford said the North Western's policy was to support only the dock companies in that section, on the theory that they were essential industries, but he was uncertain why he had recommended the purchase in the first place. He thought it was because he did not know that the concern was no longer a dock company. He did not think the transaction was a departure from the purchasing policy of insisting that all purchasing be done at the lowest price, and, when asked if freight tonnage did not enter into the situation more than the price, said that "purchases are distributed according to tonnage."

It was brought out that the North Western had bought 500 sets of Cardwell draft gear, made by the Union Draft Gear Company, after learning that the president of the company controlled the routing of the Grigsby-Grunow Company, manufacturers of the Majestic radio, which traffic had all been routed against the North Western. Since letters showed that no Cardwell gear had been bought since 1923, and that it was the Union Draft Gear Company's understanding that the road's purchases were being made from the Waugh Company, in which Armour officers were alleged to have been interested, the examiner sought to ascertain the extent to which these draft gear purchases were influenced by traffic considerations, particularly in view of the fact that the road got tonnage in the same month of the purchase.

The agent, in a letter, said:

"Mr. Cardwell is today issuing instructions with Grigsby-Grunow to favor us with all Omaha, Sioux City, Des Moines (Iowa), etc.

"He is doing this without any promises as to our purchases from his company but we know his representatives will call on within the next few days, with the hope of securing some contracts concerning new equipment, etc."

Mr. Clifford said that no test was made of the gear before applying it, but explained that the road was familiar with the Cardwell gear. He was asked if the

purchases were made to get traffic and said that all he did was to ask the car department officer if he would approve the gear for 500 cars. He denied that there was any agreement with the Union Draft Gear Company about gear but assumed that there was a hope that traffic would be obtained. He said that other companies had not been asked to bid on that equipment, but that he knew what the other prices were and also said that he got the Union Draft Gear Company to reduce its prices. Mr. Beyers testified that he knew the Union Draft Gear Company controlled the radio traffic and asked its president to swing some of it to the North Western. He did not know that the road would give him any business but told the general purchasing agent that the Cardwell Company was after draft gear business.

Early in 1929, the superintendent of motive power and the general purchasing agent of the North Western exchanged correspondence regarding the purchase of material for new locomotives. In one of these letters, the mechanical officer said:

"Our records indicate that our specification calls for the National Company's material and there would be a considerable saving to us in the maintenance and upkeep, and reductions in hot bearings if you can find a way to furnish this material, as requested."

In another letter he said:

"If I am to be held responsible for the performance of these locomotives, I should be permitted to specify the material."

After placing the order elsewhere, the general purchasing agent wrote in part as follows:

"The Magnus Company are a part of the National Lead Company and a part of the Mellon interests. They are very important to us and I do not want to be put on the black list, letting our neighbor roads enjoy the entire good will."

J. H. Liebenenthal, purchasing agent of the Chicago, Indianapolis & Louisville, taking the stand Monday morning, testified that while manufacturers are frequently put on the list of bidders in accordance with recommendations of that road's traffic department, they are never removed except for unsatisfactory prices or service. He testified that, other things being equal, the shipper is given the preference, but the low bidder gets the business, and manufacturers are not given a chance to revise their bids on account of their tonnage. He said the reciprocity activities of the last five or six years were a source of amusement rather than annoyance to him, explaining that investigations made by him had frequently disclosed that several companies commonly claimed credit for the movement of the same traffic. He recalled instances where companies tried to justify higher prices because they had traffic, but denied ever having paid higher prices in order to protect traffic, explaining that he had no authority to consider the railroad's balance sheet in getting purchases, but that his responsibilities, as he conceived them, were instead to secure a satisfactory quality of materials at the lowest price.

The Monon makes no distinction between wholesalers, small mills and large mills in getting bids for lumber, and the practice is to send out inquiries to all firms on the list and award the orders to the lowest bidder, if their quality and service is satisfactory. He testified that lubricating oils are bought on the basis of comparative tests of oil samples submitted by various companies, and that traffic does not determine who will get the business. Coal is bought at prices fixed by the Monon after a consideration of the cost of production and the prevailing market, and these prices are checked monthly to afford the Monon a chance to secure the quality of coal it desires at the lowest possible price. Questioned by Examiner Rogers as to whether the Monon ever purchases material at prices higher than

the lowest quotations in competitive bids, he said this occurs in a few cases where the low bidders cannot produce the quality or give adequate service.

H. R. Kurrie, president of the Monon, testified that, in his opinion, the Monon has lost traffic as a result of the reciprocity activities which have become intensified in the last five years. The Monon, he said, has not changed its purchasing policies except to give shippers an opportunity to bid. It is natural, he explained, that a road with a large buying power has the best argument in getting traffic. He recalled cases where traffic questions have been raised by producers to justify higher prices, but said that the Monon had not accepted the principle of paying premiums for traffic as sound. "If you accept that principle," he said, "where will it stop?" He testified that small producers have suffered from the practice, and believed that it would be a forward step if all roads could agree to quit the reciprocity practice, although he doubted if they would all so agree. He had no other remedy to suggest but explained that the public is interested in giving the small producer a chance to live, providing his prices and quality are satisfactory, and also in seeing that the railroads are not unnecessarily increasing their operating expenses.

E. P. Vernia, vice-president in charge of traffic, testified that the Monon traffic department began to utilize purchase vouchers to solicit traffic on a reciprocity basis about three and one-half years ago in self-protection and, while finding all manufacturers more responsive to traffic solicitation under this plan, believed that the small concerns were more responsive than the larger ones. He testified that the road is not getting one-fourth of the commercial traffic from the Eastern Kentucky coal field that it once did, as a result of the reciprocity activities of other roads in that field. The road, he said, has often been threatened with boycotts, particularly from lumber and coal producers.

M. J. Collins, general purchasing agent of the Santa Fe, testified that the Santa Fe never pays higher prices in order to control traffic. Reciprocity is followed to the extent of giving shippers a chance to bid when they are called to the purchasing department's attention by the traffic department. Lumber producers, however, usually get the opportunity to bid only through the recommendation of lumber inspectors after a study has been made of their reliability. The low bids are not disclosed to let friends adjust their prices and no lumber is accepted that does not meet inspection by field inspectors who mark the accepted lumber before it can be shipped.

He was questioned at length about the road's contracts for lubricating oils, and explained that these contracts are divided between the big concerns in accordance with tests made by the mechanical department which demonstrate the oil that is best for the different uses and different territories. He said that he has no discretion except as to passing upon the price, and contended that the oil purchased had to meet approved tests and that no premium was paid for the producer's traffic. The examiners then asked that the complete record of the oil tests and negotiations be brought into the hearing. Mr. Collins testified that about 95 per cent of the coal is purchased on the company's lines and that it is practically all bought direct from the mines on the basis of agreements made largely by letters or visits. He testified that contracts are made with the original low bidders where competitive bids are taken, but explained that the business is usually divided in accordance with prices which the Santa Fe fixes. He said that no agreements are made with coal producers

for traffic and that the traffic question usually is not raised, although he said that all but one of the mines have connections with other roads.

The road buys its rail mainly by dividing the tonnage between three companies which are the lowest bidders, considering freight charges to the line of road. The Santa Fe pays the Illinois Steel and the Inland Steel companies a higher price than the Colorado Fuel & Iron Co. because the former companies charge certain extras for rolling rail to the Santa Fe specifications.

J. H. McCabe, assistant freight traffic manager of the Santa Fe, who was assigned to represent that road in all reciprocity controversies with shippers when reciprocity became prevalent, said that the Santa Fe has not been in sympathy with reciprocity activities and resisted participating in the practice until forced to do so by the activities of other roads. He said the Santa Fe traffic department goes only so far as to secure daily reports of the orders placed with different firms, for the use of the agents when soliciting competitive traffic. These invoices do not show the prices paid or the value of the orders. The practice is also followed of calling the purchasing department's attention to shippers that desire an opportunity to bid or who have complaints to make regarding purchases, but no regular traffic reports are made to the purchasing agent.

The first instance of vigorous reciprocity that came to his knowledge involved a paint and varnish company about 17 years ago, but he said that the practice has become wide-spread and the pressure acute in the last five years. He believed the practice was very much of an annoyance from the standpoint of a traffic department which has plenty to do without getting mixed up with purchasing, and he thought the intervention of the I. C. C. was necessary in order to remedy the situation. He recalled having been approached on a number of occasions with reference to the control which certain producers claimed to have over the traffic of other concerns, but for the last three years he has practically ignored such arguments. A recent proposal of this kind, he said, was made by Charles Long, a paint manufacturer, who first threatened to complain to Washington after losing certain paint business from the Santa Fe, and who subsequently began to use the traffic of the Carnation Milk Company to protect and promote his paint interests. The Santa Fe ignored the pressure, he said, and lost all the Carnation Milk traffic that it had previously been getting in the vicinity of Louisville, Ky. It was his opinion that while the Santa Fe was in a position to use reciprocity more actively if the road wished, it would be best for business all over if the practice were stopped.

Correspondence was introduced during the examination of Santa Fe officers about the relations of Swift & Co. with the Mechanical Manufacturing Company, the connection between the Union Draft Gear Company and the Grigsby-Grunow Company, and also with reference to negotiations with the Forsyth Draft Gear Corporation. In this correspondence, it was shown that the president of the Forsyth Company had volunteered a list of prominent stock-holders in his company and had also reported the routing of two cars of black strap over the Santa Fe by one of these stockholders in recognition of the purchase of two gear made by the Santa Fe for test purposes. The testimony of Mr. McCabe regarding the interest of officers of Swift & Co. in the Mechanical Manufacturing Company was similar to his testimony in the Federal Trade Commission hearings as reported in previous issues of the *Railway Age*. Early in 1929, it was brought out, the

Santa Fe purchased draft gear from the Union Draft Gear Company for 450 new cars. Mr. McCabe explained that the Santa Fe had been regularly getting a liberal share of the traffic of the Grigsby-Grunow Company, which is controlled by the Union Draft Gear Company, and testified that the gear were purchased as a result of tests made by the mechanical department, quite independently of traffic considerations, and that the radio tonnage did not change after the gear were bought.

J. R. Haynes, purchasing agent of the Chicago, Burlington & Quincy, testified that it has been the practice for many years for the purchasing department to confer with the traffic department and, when the prices were low, to consider the road's shippers when making purchases. He said that concerns do not advocate, a second time, the payment of higher prices for material because of their traffic, because the Burlington gives them to understand that it does not buy traffic. If the Burlington is not satisfied with the prices offered in competitive bids, he said, the practice is not to disclose the lowest bid to the high bidders but to throw out all bids and call for new bids. Questioned concerning the relations with the Grigsby-Grunow Company, he said that this company had not been giving the Burlington traffic and the understanding was that it was because of the Burlington's failure to buy draft gear of the Union Draft Gear Company which claimed to control the Grigsby-Grunow traffic.

It is customary, he said, to refer negotiations for lubricating oil contracts to the executives of the road and to take traffic into consideration in dividing the purchases among the limited number of concerns from which the Burlington buys these oils. The prices paid for coal are fixed by the road after a study of price trends and conferences with coal producers, in which the cost of production is taken into consideration and the orders are divided among the mines, based on commercial tonnage, as shown by the quarterly reports of the traffic department.

Some of the Illinois coal is regularly obtained from a Burlington-owned mine. After testifying that this mine cost about the same to operate as other mines in the locality and disclosing that it was at present only operating three days a week, he was asked by the examiner if this was done in order to give other mines some business, to which he agreed. He was then asked if it would be cheaper to operate on a six-day basis than on a three-day basis and, when expressing the opinion that it would be, was asked if part time operation was not in the nature of paying a premium for coal. Upon questioning by counsel for the Burlington, he explained, that it was necessary to keep the mine going to protect the road from being placed at the mercy of the coal operators in fixing prices. It was disclosed that the road had allowed a producer to substitute coal from another mine and had continued paying the regular rate for this coal although it was considered to be of inferior quality. When questioned about this, he replied that the substitute coal was taken under protest and with the understanding that the difference would be made up in some other way.

H. H. Holcomb, vice-president of traffic of the Burlington, said it was customary for the purchasing department to consult the traffic department in placing orders where the prices and quality were equal and thereby to determine where the purchases should be made. It has also been customary for the traffic department to interest itself in any complaints of shippers over their relations with the purchasing department and frequently to ask the purchasing department to

have shippers or prospects given an opportunity to bid for purchases. He said that reciprocal buying, as he understood it, was more prevalent in the last five years than before and was not sure that the Burlington secured any additional tonnage as a result of its own activities, which he said were not aggressive. When asked what its advantages or disadvantages to the Burlington were, he said that he considered it annoying and embarrassing at times, the traffic department preferring not to intervene in purchasing matters, and went on to explain that the Burlington ordinarily endeavors not to do so unless the shipper raises the question.

During the examination of North Western, Santa Fe and Burlington officers, the attorney for the Commission was interrupted by numerous objections from an attorney representing the Waugh Equipment Company whenever he sought to question witnesses concerning the contents of correspondence relating to alleged relations between the traffic of Armour & Co. and the sales of the Waugh draft gear, but he was repeatedly overruled. It was brought out that the Burlington began to buy Waugh gear after negotiations were opened with the president in the following letter from the vice-president of Armour & Co.:

June 23, 1927.

"Dear Hale:

The bearer of this letter, Mr. A. J. Pizzini, is the President of the Waugh Equipment Company, in which some of your very good friends are interested.

I wanted Mr. Pizzini to know you and I am sure you can be helpful to him.

Sincerely yours,
(Signed) Arthur Meeker"

The Waugh attorney objected particularly to a report made to the operating vice-president of the Burlington by his chief mechanical officer, January 31, 1928, written in connection with studies of the Durable draft gear, then being exploited by Swift & Co., in which the writer of the letter said:

"As a matter of information would like to call your attention that we are now using the following draft gears for traffic reasons only: National, Waugh, Forsyth and Sessions."

Six exhibits were introduced in connection with the examination of the Burlington, involving a total of 150 letters, all devoted to negotiations relating chiefly to the Waugh, Durable, Forsyth, Cardwell and National draft gear. The correspondence included letters from various traffic officers of the Burlington, notifying the company that the Union Draft Gear Company had acquired control of the Grigsby-Grunow Company through stock ownership and that by orders of the Union Draft Gear Company the radio company refused to give the Burlington any traffic on account of its not purchasing any of the Union draft gear. Subsequently word came that the attitude of the draft gear company had changed and that the Burlington received traffic from the radio manufacturer, but it was brought out in the hearing that 55 carloads of radio traffic routed from Chicago to St. Paul over the Burlington were sent that way in the interest of the Great Northern rather than the Burlington. The Burlington, however, arranged to put the company on the list of bidders and, according to a letter from E. P. Bracken vice-president, in December, 1929, decided to consider the purchase of some of these gear.

The hearings were resumed on Wednesday for the purpose of re-examining officers of the North Western and hearing testimony from officers of the Chicago Great Western and the Chicago, Rock Island & Pacific.

The Pennsylvania Electrification

(Continued from page 737)

reduced to a minimum and the continuity of use of track is raised to a maximum, this being of prime importance on a busy railroad.

There has been installed and is being tried out, a length of track with the overhead catenary riveted instead of bolted together as in the past. This construction gives every evidence of being successful and if this is the case, it will even further materially reduce the amount of attention which the overhead catenary system will require and still further increase the utility of the track beneath it.

A new type of rail bond similar to the well-known signal bonds,—that is, a stranded cable welded or compressed at its ends into plug terminals driven into the rail by a hammer,—has been developed and is used on the Trenton and Norristown electrifications. The use of this bond reduces the initial cost of bonding materially and will, it is believed, reduce bonding maintenance to a minimum.

Grade Crossing Accidents Discussed at Safety Council Meetings

(Continued from page 750)

*** If the dangerous article is properly prepared, packed and delivered to the carrier, it should then be safely handled by the carrier's employees up to and including the time it is delivered to the consignee, excepting, of course, any accident in transportation. Prompt delivery after arrival at destination should be made so that the dangerous article is removed from the carrier's property and is not subject to exposure to other hazards, such as fire.

How Results Have Been Accomplished

We first started off with an acceptable set of rules, which regulated the manufacture and preparation of dangerous articles before delivery to the carrier. By co-operation on the part of manufacturers and shippers we get them to do their part. What they do not know we tell them. *** By periodical inspection their subordinate employees are checked and in this way a continued effort on the part of these manufacturers and shippers to comply with the regulations is secured. Of course, uniform application on the part of the railroads is essential. There can be no favorites. There can be no traffic pressure. ***

Education of railroad employees has been accomplished partially through the medium of illustrated lectures, first, to secure their interest, and second, by less formal talks and addresses given by district or local inspectors familiar with local conditions, and by the issuance of quarterly or bi-monthly bulletins in which are described accidents which have actually occurred and results of violations of the rules. ***

Safety in the transportation of explosives is an acknowledged fact today. During the past three years there have been no accidents in the transportation of explosives by the carriers in either the United States or Canada. Today wrecks and derailments constitute the prime cause of most of the losses in the transportation of inflammable liquids. *** No matter how carefully gasoline is packed for shipment, no matter how thoroughly employees of carriers are instructed as to its hazards, so far the Bureau of Explosives has been unable to do anything that will lessen the hazard incidental to the wrecking of a freight train involving cars containing this inflammable liquid.

The total cost of maintaining and operating the Bureau of Explosives represents an additional item in evidence showing the earnest efforts of carriers to increase the safety and efficiency of their service.

(The activities of the remaining sessions of the convention will be reviewed in the *Railway Age* of October 18.—EDITOR.)

Lower Coal Costs

THE cost per ton of coal to the railroads during the first six months of 1929 was lower than the average cost during the same period of last year, and this is also true of the cost per ton for the month of July, according to monthly reports made to the Interstate Commerce Commission. The cost per ton for 129 roads for the first six months of this year was \$2.08, not counting direct freight charges, as compared with a cost of \$2.15 on the same basis for the

About 90 roads bought their coal for less during the first half of 1930 than in 1929, while 36 roads paid more. The largest increase in cost was 20 cents per ton, paid by the Wabash and the O.-W. R. R. & N. Co., while the largest reduction was 50 cents per ton, paid by the Duluth, Winnipeg & Pacific, with the Delaware & Hudson, the Detroit & Mackinac and the Lake Superior & Ishpeming following close behind with reductions of 49, 49 and 43 cents, respectively. The average cost of coal per ton for all Class I roads was \$2.35 with freight and \$1.98 without freight in July,

Average Cost of Coal Per Ton—First Six Months

	1930		1929			1930		1929	
	Cost per Ton With Direct Freight Charges	Cost per Ton Without Direct Freight Charges	Cost per Ton With Direct Freight Charges	Cost per Ton Without Direct Freight Charges		Cost per Ton With Direct Freight Charges	Cost per Ton Without Direct Freight Charges	Cost per Ton With Direct Freight Charges	Cost per Ton Without Direct Freight Charges
New England Region									
Atlantic & St. Lawrence.....	\$5.00	\$2.17	\$5.04	\$2.07	Charleston & Western Carolina.....	2.75	1.38	2.87	1.50
Boston & Albany.....	4.28	1.95	4.32	1.91	Cincinnati, New Orleans & Texas Pacific.....	2.01	1.75	2.08	1.80
Bangor & Aroostook.....	4.59	4.59	4.58	4.58	Clinchfield.....	1.43	1.43	1.54	1.54
Boston & Maine.....	4.57	4.57	4.55	4.54	Columbus & Greenville.....	2.62	1.49	2.60	1.50
Canadian Pacific (in Maine).....	5.43	4.24	5.50	4.19	Georgia.....	3.20	1.37	3.19	1.37
Canadian Pacific (in Vermont).....	5.06	1.95	5.28	2.11	Georgia & Florida.....	3.02	1.50	3.28	1.50
Central Vermont.....	4.65	1.55	4.79	1.73	Georgia, Southern & Florida.....	3.97	2.03	4.14	2.09
Maine Central.....	4.88	4.88	4.80	4.80	Gulf & Ship Island.....	3.42	1.53	3.46	1.56
New York, New Haven & Hartford.....	3.49	1.20	3.72	1.40	Gulf, Mobile & Northern.....	2.00	1.27	2.12	1.39
Rutland.....	4.15	2.06	4.26	1.93	Illinois Central System.....	2.02	1.80	2.02	1.82
Great Lakes Region									
Ann Arbor.....	3.02	1.24	3.01	1.25	Louisville & Nashville.....	1.78	1.78	1.81	1.81
Buffalo, Rochester & Pittsburgh.....	1.75	1.75	1.74	1.74	Mississippi Central.....	2.74	1.21	2.84	1.32
Delaware & Hudson.....	3.18	2.48	3.67	3.10	Mobile & Ohio.....	2.04	2.04	2.04	2.04
Delaware, Lackawanna & Western.....	3.16	1.84	3.28	2.04	Nashville, Chattanooga & St. Louis.....	1.99	1.89	2.00	1.90
Detroit & Mackinac.....	3.57	1.30	4.06	1.40	New Orleans & Northeastern.....	3.62	1.95	3.45	1.95
Detroit & Toledo Shore Line.....	3.37	2.02	3.49	2.04	New Orleans Great Northern.....	2.78	1.32	2.77	1.34
Erie (Inc. Chicago & Erie).....	2.42	1.66	2.55	1.72	Norfolk Southern.....	3.23	1.21	3.42	1.40
Grand Trunk Western.....	3.04	1.37	3.20	1.49	Northern Alabama.....	1.63	1.63	1.74	1.74
Lehigh & Hudson River.....	3.73	1.33	3.90	1.35	Seaboard Air Line.....	2.71	1.33	2.81	1.43
Lehigh & New England.....	2.92	1.37	3.15	1.81	Southern.....	1.64	1.57	1.72	1.66
Lehigh Valley.....	3.19	1.35	3.30	1.42	Tennessee Central.....	1.86	1.86	1.75	1.75
Michigan Central Lines.....	3.58	2.38	3.54	2.36	Northwestern Region				
Monongahela.....	1.60	1.60	1.59	1.59	Chicago & North Western.....	1.85	1.85	2.19	2.19
Montour.....	2.01	2.01	2.01	2.01	Chicago Great Western.....	2.77	1.63	2.77	1.61
New Jersey & New York.....	4.77	1.92	4.78	1.93	Chicago, Milwaukee, St. Paul & Pacific.....	2.45	2.40	2.44	2.38
New York Central.....	2.24	1.85	2.38	1.96	Chicago, St. Paul, Minneapolis & Omaha.....	3.84	3.55	4.20	3.92
New York, Chicago & St. Louis.....	2.65	1.71	2.82	1.89	Duluth, Missabe & Northern.....	4.16	4.16	4.10	4.10
New York, Ontario & Western.....	3.01	1.21	3.17	1.44	Duluth, South Shore & Atlantic.....	4.09	3.67	4.30	3.75
New York, Susquehanna & Western.....	4.42	1.86	4.42	1.88	Duluth, Winnipeg & Pacific.....	4.08	3.81	4.58	4.36
Pere Marquette.....	3.38	1.56	3.41	1.59	Great Northern.....	3.41	3.39	3.64	3.58
Pittsburgh & Lake Erie.....	1.76	1.63	1.88	1.69	Green Bay & Western.....	4.52	4.30	4.73	4.73
Pittsburgh & Shawmut.....	2.23	2.23	2.25	2.25	Lake Superior & Ishpeming.....	3.74	3.74	4.17	4.17
Pittsburgh & West Virginia.....	1.26	1.26	1.55	1.55	Minneapolis & St. Louis.....	2.21	2.00	2.47	2.37
Pittsburgh, Shawmut & Northern.....	1.80	1.80	1.80	1.80	Minneapolis, St. Paul & Sault Ste. Marie.....	3.69	3.18	3.89	3.37
Ulster & Delaware.....	4.26	1.69	4.30	1.73	Northern Pacific.....	2.70	2.70	2.67	2.67
Wabash.....	2.25	1.78	2.05	1.85	Oregon-Washington R. R. & Nav. Co.....	3.72	2.20	3.52	2.16
Central Eastern Region									
Akron, Canton & Youngstown.....	2.47	1.45	2.52	1.50	Spokane International.....	5.15	3.24	5.53	3.63
Atlantic City.....	3.44	1.82	3.58	1.92	Central Western Region				
Baltimore & Ohio.....	1.55	1.52	1.61	1.57	Atchison, Topeka & Santa Fe.....	2.97	2.91	2.96	2.86
Bessemer & Lake Erie.....	1.99	1.90	2.03	1.96	Bingham & Garfield.....	4.17	1.90	4.15	2.53
Buffalo & Susquehanna.....	1.63	1.63	1.65	1.65	Chicago & Alton.....	2.23	2.23	2.19	2.19
Central R. R. of New Jersey.....	3.45	1.58	3.49	1.56	Chicago, Burlington & Quincy.....	2.16	2.11	2.17	2.13
Chicago & Eastern Illinois.....	1.96	1.92	2.10	2.05	Chicago, Rock Island & Pacific.....	2.46	2.24	2.50	2.33
Chicago & Illinois Midland.....	1.91	1.91	1.88	1.88	Colorado & Southern.....	2.80	2.76	2.88	2.84
Chicago, Indianapolis & Louisville.....	1.86	1.86	1.94	1.94	Denver & Rio Grande Western.....	1.99	1.98	2.01	2.00
Cleveland, Cincinnati, Chicago & St. Louis.....	2.45	2.02	2.65	1.95	Denver & Salt Lake.....	1.26	1.26	1.19	1.19
Detroit, Toledo & Ironton.....	2.80	1.74	2.95	1.91	Fort Worth & Denver City.....	6.16	2.90	6.09	3.03
Egin, Joliet & Eastern.....	2.12	2.12	2.24	2.24	Nevada Northern.....	4.55	1.75	4.55	1.75
Illinois Terminal.....	2.80	2.80	2.69	2.65	Oregon Short Line.....	3.14	2.59	3.19	2.60
Long Island.....	3.86	1.65	3.85	1.64	Quincy, Omaha & Kansas City.....	2.61	2.60	2.65	2.62
Missouri-Illinois.....	1.75	1.75	2.10	2.10	St. Joseph & Grand Island.....	3.54	3.12	3.58	3.14
Pennsylvania System.....	1.83	1.80	1.85	1.82	Southern Pacific Co.....	3.02	3.02	2.91	2.91
Reading Company.....	2.90	1.70	2.85	1.68	Toledo, Peoria & Western.....	2.83	1.42	2.72	1.31
Staten Island Rapid Transit.....	4.08	1.74	4.10	1.76	Union Pacific.....	2.53	2.51	2.54	2.52
Western Maryland.....	1.82	1.81	1.83	1.83	Utah.....	1.07	1.07	.76	.76
Wheeling & Lake Erie.....	1.57	1.57	1.71	1.71	Western Pacific.....	3.12	1.89	3.17	1.89
Pocahontas Region									
Chesapeake & Ohio.....	1.62	1.62	1.63	1.63	Southwestern Region				
Norfolk & Western.....	1.57	1.57	1.59	1.59	Fort Smith & Western.....	3.49	3.49	3.47	3.47
Richmond, Fredericksburg & Potomac.....	3.46	1.29	3.39	1.15	Kansas City Southern.....	2.54	2.54	2.73	2.70
Virginian.....	1.95	1.95	1.96	1.96	Kansas, Oklahoma & Gulf (Inc. K. O. & G. of T.).....	2.60	2.60	2.59	2.59
Southern Region									
Alabama Great Southern.....	2.42	1.94	2.47	2.05	Midland Valley.....	2.67	2.67	2.60	2.60
Atlanta & West Point.....	3.07	1.72	3.11	1.80	Missouri & North Arkansas.....	2.86	1.24	2.94	1.48
Atlanta, Birmingham & Coast.....	1.92	1.50	2.25	1.85	Missouri-Kansas-Texas.....	3.04	2.75	3.05	2.69
Atlantic Coast Line.....	2.95	1.40	3.10	1.57	Missouri Pacific.....	2.13	2.06	2.34	2.28
Central of Georgia.....	2.19	2.11	2.23	2.13	St. Louis-San Francisco.....	2.38	2.25	2.44	2.29
					St. Louis, San Francisco & Texas.....	4.30	3.22	3.84	3.72
					St. Louis Southwestern Lines.....	2.21	1.34	2.20	1.33

first six months of 1929, an average reduction of 7 cents per ton. The cost per ton, including freight charges, averaged \$2.95 for the first half of 1930, as compared with \$2.98 on the same basis for 1929, an average reduction of 3 cents per ton. The average freight paid was 87 cents per ton.

this year, as compared with \$2.40 with freight and \$2.02 without freight in July, 1929. The average cost of coal per ton with and without direct freight charges during the first six months of 1930 and 1929 on the roads for which reports are available are as shown in the accompanying table.

Looking Backward

Fifty Years Ago

The Delaware, Lackawanna & Western's construction of its proposed extension from Binghamton, N. Y., to Buffalo was inaugurated on October 6 by the formal breaking of ground near the former point. It is stated that work will be pushed vigorously along the whole line.—*Railway Age*, October 14, 1880.

The Northern Pacific is making hopeful progress in its long journey across the continent. From Duluth, Minn., and St. Paul westward it has in operation 586 miles, and on the Pacific side, from Tacoma, Wash., eastward, 105 miles, making 691 miles, exclusive of branches. The gap to be filled to complete the main line from Lake Superior to the Columbia river at Ainsworth, Wash., will be about 820 miles. The directors state: "The close of 1884 ought to see the entire road finished. With pushing and a favorable money market the time can be shortened."—*Railway Age*, October 14, 1880.

The Canadian Government has concluded an arrangement with a banking firm in London, a financial association in Paris and a financial house in New York for the construction and operation of the Canadian Pacific from Ottawa to the Pacific Coast. The government is to give a subsidy of several millions sterling, a number of million acres of land, and also the line already built and the surveys of the entire road, both of which are estimated to have cost between five and six million sterling. The length now under construction is about 722 miles, 127 miles of which are in British Columbia. The cost of the 406 miles from Fort William, Ont., to Selkirk, Man., will be about \$17,000,000. For the whole route from Lake Superior to the Pacific Coast the government engineer in chief estimates that an expenditure of \$60,000,000 will be required.—*Railroad Gazette*, October 8, 1880.

Twenty-Five Years Ago

H. J. Pfeifer has been appointed engineer maintenance of way of the Terminal Railroad Association of St. Louis and affiliated companies. G. H. Minor has been appointed assistant general solicitor of the Erie with office at Cleveland, Ohio. J. E. Baxter, hitherto auditor of the Gulf, Colorado & Santa Fe, has been appointed assistant general auditor of the Atchison, Topeka & Santa Fe system, with office at Chicago.—*Railway Age*, October 13, 1905.

The administration program for railway rate legislation has been semi-officially announced at Washington. After several conferences with President Roosevelt it was stated that a new bill would be drawn to embody the following points: That the Interstate Commerce Commission shall be given the power to decide upon complaint after full hearing, whether a rate is unjust or unlawful; the commission shall have authority to declare that a rate charged for shipment on private cars is unjust or unreasonable; giving the commission jurisdiction over terminal railroads; A reassertion of the long and short haul clause of the Interstate Commerce Act of 1887; giving the commission full authority to examine books and records of railroads.—*Railway Age*, October 13, 1905.

Ten Years Ago

Charles Donnelly, now executive vice-president of the Northern Pacific, has been elected president of that railroad, effective November 19.—*Railway Age*, October 8, 1920.

Reports just compiled by the Car Service division of the American Railway Association show that the volume of freight traffic is holding its own despite the increase in freight rates which went into effect on August 26.—*Railway Age*, October 8, 1920.

New Books

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Annual Statistical Report of the American Iron and Steel Institute for 1929. Statistics of production of iron and steel subdivided into the usual classifications, also production and shipments of iron ore, coal and coke, imports and exports, and tabulations of prices. 119 p. Pub. by the American Iron and Steel Institute, New York.

Biennial Census of Manufactures, 1927, compiled by U. S. Bureau of the Census. Group 14 covers "Transportation Equipment, Air, Land, and Water" pages 1121-1167. Group 15 covers "Railroad Repair Shops" pages 1168-1176. The general table "Combined summary of all manufacturing industries, for the United States: 1849-1927 on pages 14-15 may also be of interest. 1497 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. \$2.25.

Rhymes of the Rail, by C. J. Byrne. A small volume of verse on railroad life. 31 p. Pub. by Rhymes of the Rail Co., St. Paul, Minn.

Periodical Articles

The ABC of Rail Holding Companies, by Oliver Wesson. Illustrated. *Nation's Business*, October, 1930, p. 15-17, 195.

Impressions of an Ex-Commerce Commissioner, by Thomas F. Woodlock. "An experience of over five years as a member of the Interstate Commerce Commission leaves me with many impressions. Of these, I select three for present discussion in the belief that they concern aspects of the matter upon which the public should be informed. The first deals with the spirit of the Transportation Act. The second deals with the fundamental flaw in that Act. The third deals with the principal practical difficulty in its administration. In discussing all three I shall, of course, speak only for myself." *Barron's*, September 29, 1930, p. 10-11.

Note on the Application of Premiums for Improved Output in the Marshalling Yards of the French Est Railway. Discusses physical and psychological problems involved and illustrates forms used for records. *Bulletin of the International Railway Congress Association*, September, 1930, p. 1977-2001.

Railroad Consolidation: What of It? by William Z. Ripley. A review of ten years' development in railroading, concluding about consolidation . . . "this issue, far from being dead, deserves to be kept at the forefront of railroad affairs." p. 112. *World's Work*, October, 1930, p. 24-29, 108-112.

Stabilizing Employment. A series of articles including "Unemployment insurance in Great Britain" by Margaret Bondfield; "Unemployment compensation" by John R. Commons; "Unemployment insurance," by Franklin D. Roosevelt; "Can management prevent unemployment," by Paul H. Douglas; "What employers are doing," by Ernest G. Draper; "Will Congress choose the way out?" by Robert F. Wagner and additional articles on several other phases of the problem. *American Labor Legislation Review*, September 1930, p. 237-308.

Unemployment Insurance Pushes Forward as a Political Issue. A review of bills introduced and other efforts. *The Business Week*, October 1, 1930, p. 24-25.

We Pay A Visit to Busy Baltimore, by Paul McCrea. Map, showing railroads and water terminals, p. 50. Illustrated. *Nation's Business*, October, 1930, p. 50-52, 210.

What the Whistles Mean, by Stewart Beach. "The locomotives and the steamships have vocabularies of their own." "Locomotive whistles are not so much traffic signals as a loud-speaker game of questions and answers between the engineer and other interested parties. . . ." p. 62. *Holiday*, October, 1930, p. 44-45, 62.

Odds and Ends of Railroading

"Heap Big Chief"

John Arten, of the Great Northern at Superior, Wis., is one of the few full-blooded Indian enginemen in the country. John is a Chippewa, and, as one of the chiefs of his tribe, he has frequently made trips to Washington, D. C., in the interests of his brethren.

Believe It or Not Department

The Chicago & Alton is the short line between Louisiana and Mexico, its fastest trains making the run in 1 hr. 10 min. Strange, but true, particularly since we are referring to the stations of Louisiana, Mo., and Mexico, Mo., on the Kansas City-Chicago line of the C. & A.

Those Mayors Again

RICHMOND, VA.

TO THE EDITOR:

Speaking of railroad mayors, I wish to mention that A. E. McInter, agent, Richmond, Fredericksburg & Potomac, Quantico, Va., is also mayor of that city and D. G. Stutz, agent, Seaboard Air Line, Southern Pines, N. C., is mayor of that city. Both of these gentlemen have served in their dual capacity for several years.

E. L. TRANT,
Richmond, Fredericksburg & Potomac.

How Many Do You Know?

CLEVELAND, OHIO.

TO THE EDITOR:

Here is a list of crack trains that was submitted to a group of traveling men at a recent party. The object was to name the parent railroad and the relative destinations:—

The Ak-Sar-Ben	The Commodore Vanderbilt
The Shasta Limited	The Royal Palm
The Flying Yankee	The Minute Man
The Crescent Limited	The Overland Limited
The Broadway Limited	The Congressional Limited
The Chief	The Golden State Limited
The International Limited	The Southwestern Limited
The Black Diamond	The Olympian
The Sunset Limited	The Scenic Limited
The Twentieth Century Limited	The Corn King Limited
The Yankee Clipper	The Maple Leaf
The American	The Wolverine
The Pioneer Limited	The Blue Comet
The Panama Limited	The Manhattan Limited
The Capitol Limited	The Northwestern Limited
The Sportsman	The Banner Blue Limited
The North Coast Limited	The Boardwalk Flyer
The Black Hawk	The Twilight Special
The National Limited	The North Shore Limited
The Dixie Limited	Queen & Crescent Limited
The Pan American Limited	The Ambassador
The Oriental Limited	The Red Arrow
The Golden Arrow	The Imperial Limited

W. N. JEAVONS,
Architect.

Another Long-Distance Commuter

When Addison H. Day climbed aboard the 7:55 express on the Delaware, Lackawanna & Western at Chatham, N. J., on Friday, August 1, he nonchalantly began his sixty-second year as a commuter between Chatham and New York as a part of the day's work. When he began commuting, the journey was made by stage to the Oranges, where a mail train stopped to take on passengers for New York. The cars were lighted by kerosene lamps, had wood-burning stoves and the engines also burned wood. Mr. Day, who is an official of the Marine Midland Trust Company, has traveled some 930,000 miles going to and coming from work, which unique record stamps him as one of the champion commuters of all time.

Fifty-year Men

NASHVILLE, TENN.

TO THE EDITOR:

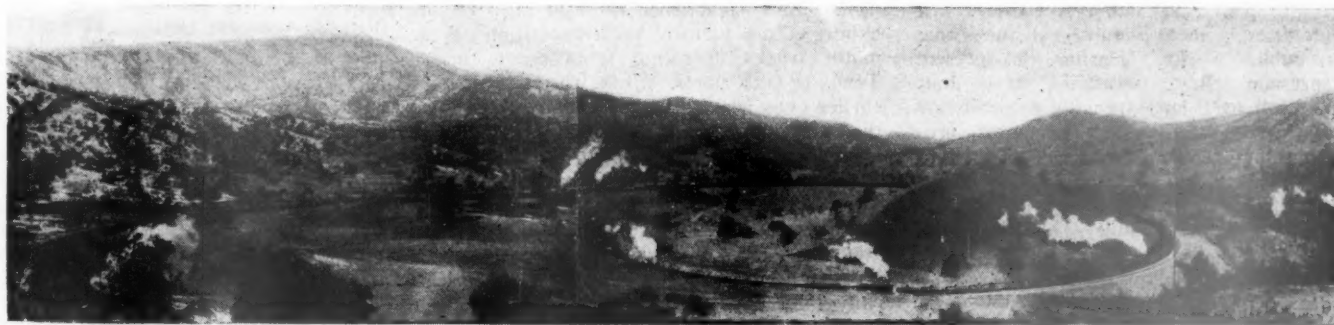
In a recent issue of the *Railway Age* under "Odds and Ends," you recorded Dr. Letcher, who had been on the same job in the same place with the Louisville & Nashville over 50 years.

You can add another man on the L. & N. with the remarkable record of 54 years' service on the same job in the same place. T. L. Rose, agent at Georgiana, Ala., holds that distinction. Mr. Rose is an author of some repute, having written two or three books and many pamphlets, particularly with reference to uplift work among boys. He has the distinction of having been instrumental in the education of more than 50 young men. He has been somewhat of a traveler, having made several trips to various parts of the world.

L. G. WALDROP,
Superintendent, Louisville & Nashville.

An Endless Train

The apparently endless freight train shown in the illustration looping a loop and extending down the mountain canyon for several miles, is matched together from pictures taken by Frank Nejedly, veteran telegrapher of the Southern Pacific. As a matter of fact, however, it is quite possible for a train to loop itself in climbing the grades of the Tehachapi mountains south of Bakersfield, Cal. The head locomotive on a train of 70 cars will pass over the top of the loop while the caboose is still in the tunnel below. When the first railroad was being surveyed over these mountains 54 years ago for the first rail line between San Francisco and Los Angeles, the Southern Pacific construction engineers were puzzled for some time with the problem of gaining the required elevation in a limited distance by means of practical grades and curves. The "loop" idea perfected by the late Chief Engineer William Hood, made it possible to climb 77 ft. in a distance of only 3,795 ft. by tunneling through a ridge and swinging the tracks on a gradual grade around the crest of a peak so that the track passed over itself in a complete circle. In scaling this mountain range the railroad climbs 2,734 ft. through 18 tunnels in a distance of but 28 miles, with a total curvature of 6.676 deg. and a maximum grade of 2.2 per cent.



An Endless Train, If the Camera Is To Be Believed

NEWS

President Hoover Finds Railways Handicapped

*Tells bankers roads could be
made greater balance
wheel of stability*

The railroads "have been handicapped by some provisions of the transportation act of 1920" in their efforts to afford relief to unemployment by expanding construction work and "with wider public vision the railways could be strengthened into a greater balance wheel of stability," said President Hoover in his address at the American Bankers' Association convention at Cleveland on October 2. He gave no indication, however, as to what provisions of the law he had in mind. Railroad men have taken the position that the Interstate Commerce Commission's policy of regarding the "fair return" contemplated by the act as a maximum (not yet attained) has prevented them from earning sufficient in prosperous years to enable them to do much balancing in times of depression; but it is generally understood that this is a matter of administration rather than of the law itself.

Discussing means of co-operation between the business world and the government in the development of policies of business stability the President spoke as follows:

"The regulatory functions of the federal and state governments also have a bearing on this subject through their effect upon the financial strength of the railways and utilities. During a period of depression the soundest and most available method of relief to unemployment is extension of public works and construction in the utilities, railways and heavy industries. The volume of possible expansion of construction in these private industries is about four or five times that in public works. During the present depression these industries have done their full part, but especially the railways have been handicapped by some provisions of the transportation act of 1920. With wider public vision the railways could be strengthened into a greater balance wheel of stability. We have need to consider all of our economic legislation, whether banking, utilities, or agriculture, or anything else, from the point of view of its effect upon business stability."

Low Fares Continued in West

Railroads operating into Denver from lower Missouri river points have extended to November 1 the \$11 passenger coach rate established a month ago to regain some of the passenger business lost to automobiles. The decision to place the low fares in effect throughout October is the result of the success of the experiment in stimulating travel during September.

Rail Rates Reduced to Meet Truck Competition

*Low rates on baled cotton
established by several
southern roads*

In several instances recently railroads have sought permission of the Interstate Commerce Commission to publish reduced rates on short notice to meet the competition of motor trucks. A tariff filed by Agent Glenn, effective on September 19, established rates on cotton in cents per bale instead of per hundred pounds from points on the Louisville & Nashville in Florida and southern Alabama to Pensacola and Mobile, to expire on December 31, because the truck rates are stated in amounts per bale.

A rate of 47 cents per hundred from Andalusia, Ala., to Pensacola, Fla., equivalent to \$2.35 a bale, was cut to \$1.25 a bale, and a rate of 55 cents per hundred from Graceville, Fla., was reduced to \$1.25 a bale. In the Southwest a Fonda tariff, made effective on one day's notice, established reduced rates on export cotton to meet the competition of motor trucks operating from points in Texas to Gulf ports. These rates replace earlier ones which had been published for the same purpose but the territory of their application has been widened. The Atchison, Topeka & Santa Fe also was allowed to make effective on October 25 a tariff making reductions in rates on canned goods between California stations, stating that it was desired to place the company in a position to compete with unregulated motor truck lines for a share of the available business.

Eight Months Net Down 32.9 Per Cent from 1929

*Return only 3.59 per cent as
against 5.48 for same
period last year*

Class I railroads of the United States for the first eight months this year had a net railway operating income of \$555,302,118, which was at the annual rate of return of 3.59 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the eight months of 1929, their net railway operating income was \$828,394,791, or 5.48 per cent on their property investment. The reduction was 32.9 per cent. Operating revenues for the eight months totaled \$3,615,071,417, compared with \$4,213,688,668 for the same period last year, or a decrease of 14.2 per cent. Operating expenses amounted to \$2,732,292,415, a decrease of 10 per cent.

In the eight months taxes paid amounted to \$244,889,277, compared with \$270,647,132 for the same period last year, a decrease of 9.5 per cent. For August alone, the tax bill amounted to \$32,579,941, a decrease of \$5,791,316 under August of the previous year.

Nineteen Class I railroads operated at a loss in the eight months of 1930, of which 6 were in the Eastern district, 2 in the Southern district and 11 in the Western.

Net railway operating income by districts for the eight months with the percentage of return based on property investment on an annual basis was as follows:

New England Region.	\$28,462,048	4.85 per cent
Great Lakes Region..	93,853,722	3.28 per cent
Central Eastern Region	127,335,211	3.77 per cent
Pocahontas Region...	53,636,507	7.46 per cent
Total Eastern District	54,492,645	2.61 per cent
Total Southern District	54,492,645	2.61 per cent
Northwestern Region.	48,596,946	2.73 per cent
Central Western Region	99,204,498	3.72 per cent
Southwestern Region.	49,720,541	3.61 per cent
Total Western District	197,521,985	3.39 per cent
Total United States.	\$555,302,118	3.59 per cent

For August the net railway operating income was \$95,603,923, which, for that month, was at the annual rate of 3.38 per cent. In August last year, the net was \$141,758,501, or 5.13 per cent.

Operating revenues for August amount—
(Continued on page 777)

Motor Coach Companies Oppose Low Rail Fares

Texas lines argue against proposed two-cent fare on Texas & Pacific

Motor coach companies in Texas opposed the establishment of a two-cent-a-mile railroad passenger rate between Fort Worth and Big Spring, at a hearing before representatives of the Railroad Commission of Texas at Austin, Tex., on October 3 on the application of the Texas & Pacific to establish such a rate. J. C. Duval, attorney for the Southland-Greyhound Bus Lines, stated that if the railroad commission should grant the pending application, the low rate would seriously affect motor bus transportation, especially on routes paralleling railroads. Mr. Duval also said that the railroads are making a deliberate attempt to destroy motor coach transportation in Texas. The Southern Air Transport Company was represented at the hearing by Raymond Buck, an attorney at Fort Worth.

Before the hearing had progressed to any extent, representatives of motor coach lines asked for a continuance, declaring that they are entitled to a 10-days' notice of the proposed hearing. The motion was considered and the hearing will be resumed at a later date, probably the latter part of October.

Canadian Railways Aid Employment

It was announced last week at Ottawa by Hon. Gideon Robertson, Minister of Labor, who is working out the details of the government's plans for relieving unemployment chiefly by the speeding of works programs by large corporations such as the railways, that the railways would proceed immediately with a \$21,000,000 program of construction and improvement work.

Employment for 10,500 men thereby would be provided for a year, and 2,000 teams of horses would be given work for a considerable part of the time, especially for grading purposes. The employment of teams would help western farmers in many districts.

Senator Robertson stated that the Dominion had agreed to compensate the railways for 5 per cent of the \$21,000,000 for a period of a year and three months. By this expenditure of \$1,600,000 in the way of interest, expenditures of \$21,000,000 would be made by the railways.

The Minister of Labor stated that with an expenditure of \$20,000,000 by the Dominion, \$21,000,000 by the railways, and by expenditures by the provinces and municipalities there would be between \$80,000,000 and \$90,000,000 set afloat in Canada to aid unemployment.

Senator Robertson stated that all the work done by the railways would be with materials made in Canada. Very substantial orders for new 100-pound steel rails to be purchased in Canada will be

used by the railways, which would mean increase of thousands of tons of Canadian coal used in the manufacture of the rails.

Announcement also was made by Senator Robertson that the Canadian National had agreed to increase its purchase of coal by 100,000 tons. The company will also use Nova Scotia coal as far west as Brockville and Ottawa, which would mean an additional purchase of 100,000 tons. The Canadian Pacific has also promised to increase its purchase of Canadian coal materially.

One million dollars will also be set aside out of the \$20,000,000 unemployment relief money to augment the grade separation fund for the removal of level crossings, which will be administered, as in the past, by the Board of Railway Commissioners. These undertakings, with the \$4,000,000 set aside for "direct relief," in addition to other undertakings in contemplation, would absorb approximately \$8,000,000, leaving \$12,000,000 available for the construction of public works by provincial governments and municipalities with federal aid.

One hundred miles of track on the Canadian Pacific in Ontario will be relaid with a heavier rail section, according to the program, and 150 miles of the heaviest rail section so far used in Canada will be laid in British Columbia.

Rock ballasting will be started on an extensive scale on the Lachute subdivision, on the Galt subdivision and on the Algoma district, all in eastern Canada. Gravel ballasting will be done on the New Brunswick district.

Extensive branch line development in northern Saskatchewan also was promised by the C. P. R. president. From Prince Albert four important branch lines will connect the north portion of the province. Construction of the Nipawan branch to Prince Albert, Mr. Beatty mentioned, will be pushed forward without interruption. The 90 miles of the branch westward to connect ultimately with the Alberta Great Waterways Railway in Alberta, near Lac la Biche, has been graded, he added. Next year track will be laid on the graded section and grading will proceed toward the Alberta destination.

Mid-West Cities Plan Opposition to Class Rate Decision

Representatives of industries of Minneapolis, Minn., St. Paul, and Duluth, Wis., met at St. Paul, on October 2 to discuss a joint program of the three cities in their opposition to the class freight rates recently established by the Interstate Commerce Commission. A petition for reconsideration will be presented within a few days.

Philadelphia to New York, Twenty Minutes

Captain Frank M. Hawks returning from the ball game at Philadelphia on October 8, flew from that city to New York in 20 minutes. The fastest railroad train takes two hours. Recently Captain Hawks flew from Detroit to New York in two hours, 45 minutes; estimated distance 640 miles; quickest railroad time 14 hours.

I. C. C. Declines to Confer on Rate Cases

Refuses request of western roads for discussion of decisions

The Interstate Commerce Commission has declined a request made by Charles Donnelly, president of the Northern Pacific, on behalf of a committee of presidents of western railroads, for an informal conference to discuss the general condition of the railroads with particular reference to the western grain rate case and the western trunk line class rate case. The request was made personally by Mr. Donnelly on September 18 and on October 8 the commission made public a copy of a telegram sent the day before by Chairman McManamy in reply to a further telegraphic request by Mr. Donnelly as to whether the conference would be granted.

Chairman McManamy said he had placed the request before the commission, which had directed him to advise "that such a discussion will of necessity involve litigated cases upon which formal petitions are now pending" and that "therefore your request for conference cannot with propriety be granted."

The western trunk line case involves a general revision of class rates which the commission estimated would result in an increase in the revenues of the western roads of \$10,000,000 to \$12,000,000 a year, although some officers of the roads have expressed a doubt as to whether it would have that much effect. On the same day the commission also made public an order requiring a general revision of grain rates in the western district and for export, including a rather general reduction which Commissioner Woodlock estimated would reduce the revenues of the western roads by at least \$15,000,000 and which the western roads estimated at over \$20,000,000. The roads have petitioned the commission for a rehearing or reconsideration of the grain case, on the ground that it would have a most serious effect on their revenues at a time when the commission should rather be looking for rates to be increased, and some of the state commissions and grain interests have opposed such a step.

The petition filed by the roads took the position that it is unlawful under section 15a of the interstate commerce act for the commission to order reductions in rates on such a substantial volume of traffic as the grain traffic when they have never received the fair return.

The commission on October 8 also issued a notice to interested parties that the railroads in the eastern and western class rate cases had informed the commission that they will be unable to make effective before February 1 the revisions of class rates prescribed by the commission. The commission did not enter specific orders in these cases but said that it was highly desirable that they be made effective on or before November 1.

Federal Court Hears U. P. Protest on Oregon Line

Contentions that the amount of prospective traffic for the line between Crane, Oregon, and Crescent, which the Interstate Commerce Commission has ordered the Oregon-Washington Railroad & Navigation Company to construct would be far less than that estimated by the commission, and that such a line would seriously interfere with profitable operation of the new Southern Pacific line between Klamath Falls, Oregon, and Fernley, Nev., were made by railroad attorneys at the injunction hearing before a federal court of three judges at Portland on September 29 and 30. The handing down of a decision in this case, in which the Union Pacific has petitioned for an injunction to restrain the Interstate Commerce Commission from enforcing its order of December 3, 1929, to construct this 185-mile connection between the Union Pacific and Southern Pacific systems, may be delayed through the death of one of the judges, Frank S. Dietrich. Judge Dietrich, a member of the United States Court of Appeals, died in an automobile accident at Boise, Idaho, on October 2, and it is expected that as a result a rehearing of the case will be necessary.

The Oregon Eastern, now a part of the Oregon-Washington, originally planned the construction of a line across Oregon from Ontario to Eugene, A. C. Spencer, general solicitor of the O.-W.R. & N. stated, with branches to Klamath Falls and Lakeview. Construction was completed from Ontario to Crane in 1916 when the Southern Pacific was controlled by the Union Pacific. Federal proceedings divorcing the two railroads altered the situation and the Southern Pacific subsequently established a new route from the Northwest to the East by the construction of its line through Alturas, leaving the Union Pacific without any reasonable hope of developing a profitable traffic from western Oregon. The Union Pacific abandoned its plans for a right of way across Oregon in 1924, he said.

Mr. Spencer challenged the estimates of the probable traffic which would accrue to the line as presented to the commission and stated that local traffic is negligible. He also pointed out that a report prepared for the Oregon Public Service Commission states that construction of the line would involve the diversion of traffic from one line to another. Alfred A. Hampson, general attorney for the Southern Pacific, stated that the construction of the line would be an economic tragedy for the Southern Pacific's new line.

Mr. Spencer contended that since railroads are repeatedly given permission to abandon unprofitable lines, it would be placing too broad an interpretation on the transportation act to state that the commission has the power to require a railroad to construct a line that would be unprofitable, extending such a line at a cost of about \$11,000,000 into a territory which the railroad does not serve and does not contemplate serving.

J. S. Payne, an attorney for the commission, in his statement pointed out that this order constitutes the first time that that body has exercised such authority. The Oregon commission's findings show that the proposed line would show a profit of 6 per cent for the first year, increasing to 10.4 per cent at the end of five years. Mr. Payne declared that the railroad has not been farsighted enough to realize that it would profit by construction of the line, and stated that this construction, instead of depriving the Union Pacific of funds for the operation of its lines, would add to its assets, and place the road in a more advantageous position than if it were to buy stocks or bonds with its surplus. He also referred to the government as being ahead of the railroad in the fostering of proper transportation development.

Kentucky Rate Investigation

An investigation of freight rates in Kentucky was begun by the Kentucky Railroad Commission on October 1. The commission, under a law passed by the 1930 session of the General Assembly, has power to revise intrastate rates.

Eastern Roads Ask Rehearing of Grain Rate Case

The eastern railroads have petitioned the Interstate Commerce Commission for a rehearing and reconsideration of the western grain rate case, saying that the commission's order will result in a substantial reduction of their revenues and that the commission considered only the condition of the western lines although the order affects rates participated in by the eastern lines.

Railway Employment Further Reduced in July

A further large reduction in the number of railway employees took place between June 15 and July 15, according to the Interstate Commerce Commission's monthly statement of railway wage statistics. The number of employees reported by Class I roads as of the middle of July was 1,531,711, a decrease of 32,566 as compared with the number on June 15 and of 213,185 as compared with the number in July last year. This follows a reduction of 37,208 in the number on June 15, as compared with the preceding month.

The number of employees in July was less than in any July since 1922, when there was a shop strike, and when the number was 1,467,824. In July, 1923 the number was 1,954,687.

Compared with the returns for the corresponding month of last year, the summary for July, 1930, shows a decrease of 12.22 per cent in the number of employees, while the total compensation, \$217,885,133, shows a decrease of \$37,009,758, or 14.52 per cent. The number of executives, officials and staff assistants shows a reduction of 470; the group of professional, clerical and general employees a reduction of 19,873; maintenance of way and structures a reduction of 83,199; maintenance of equipment and stores, a reduction of 57,050; and transportation employees a reduction of 52,593.

N. Y. Commission Appoints Examiners

The Public Service Commission of New York has appointed two examiners to assist in the work of holding hearings. These positions were created at the past session of the Legislature of the State and pay an annual salary of \$6,000. It is planned to have the examiners hold hearings for the Commission in various sections of the State and thereby make it possible to conduct these proceedings nearer to the homes of complainants or others interested in the cases.

Hearing in Gulf & West Texas Case

No opposition to the acquisition of the Gulf & West Texas by the Southern Pacific was voiced at a hearing before J. F. Sullivan, examiner for the Interstate Commerce Commission, at Dallas, Tex., on October 1. Acquisition of the line, which has received a certificate from the commission for construction of new lines between San Angelo, Tex., and Eden, and between Brady and a connection with the Southern Pacific at Fredericksburg, would be by purchase of capital stock. The cost of construction of the 113 miles of line is estimated at \$5,850,000.

Pacific Travel Association Organized

The Pacific Travel Association, with offices at 321 Matson building, San Francisco, Cal., has been organized by a group of hotel men, advertising men and others interested in promoting travel to the Pacific Coast, for the purpose of stimulating such travel. The plan provides for raising \$250,000 annually, for a period of three years, among the railroads, steamship companies, hotels, general transportation companies and other interests concerned with tourist travel to the west coast, and \$200,000 among the interests concerned in travel to the Orient, Australia and New Zealand, or a total of \$450,000 to be spent annually for advertising and otherwise stimulating travel. The association, of which E. H. Lawson is executive secretary, has succeeded in gaining much favorable interest. Up to the present time the assistance given by the railroads has consisted of small sums as an aid in starting the work of the association and as a means of determining the effectiveness of the plan.

Time for Special Drought Rates Extended

The Interstate Commerce Commission on October 7 issued an amendment of its order of August 9 in which it gave blanket authority to the railroads to establish reduced rates on livestock, feeds, water and such other articles of traffic as might be found necessary to and from drought-stricken areas without observing the usual requirements as to tariff publication. The amendment postpones from October 31 to March 31, 1931, the date of the expiration of the authority. The special joint tariffs filed by the roads making reduced rates effective were by their terms also limited to October 31.

The Department of Agriculture has announced that continued drought throughout a large portion of the drought area during the last month made it necessary for the Secretary of Agriculture to certify to the railroads additional counties as entitled to reduced rates. Those added to the list on October 4 included 1 in Virginia, 3 in Tennessee, 20 in Texas, 1 in North Carolina, 7 in Georgia, 2 in Missouri, 3 in Alabama and 5 in New Mexico. This means that 1,016 counties in 21 states are now certified as entitled to reduced rates.

Indiana Commission Ignores I. C. C.

The Public Service Commission of Indiana ignoring the orders of the Interstate Commerce Commission of May 20 suspending rates on manufactured iron and steel products in Indiana, has issued an order rescinding the rates and re-establishing the group rates which prevailed in Indiana before the Interstate Commerce Commission intervened. The Interstate Commerce Commission rates on iron and steel products are based on mileage, whereas the rates which will supplant them are grouped with the same rate prevailing for cities within a given shipping area.

The Starucca Viaduct

The photographic cut here shown is a picture of the well-known Starucca viaduct of the Erie at Lanesboro, Pa., near Susquehanna, reprinted here by courtesy of the Erie Railroad Magazine. This viaduct was begun in 1848, the engineer being James O. Kirkwood, a graduate of Edinburgh College, Scotland. Mr. Kirkwood took part in the construction of the Stonington (Connecticut) railroad in 1835, and later in that of the Long Island and the Western, which latter is now a part of the Boston & Albany.

The Starucca viaduct is 1,200 ft. long,

18 spans, and 110 ft. high at the highest point. It carries a double track and there has been no need of strengthening it for the modern heavy locomotives. The stone was brought from a quarry three miles upstream. In May, 1848, there were at work on this enterprise 800 men; and the total cost of the work, \$320,000, gave the viaduct the distinction of being the most costly railroad bridge in America at the time. This section of the Erie was opened for business in December, 1848.

Opening of K. C. M. & O. to the Rio Grande

Operation of the new line of the Kansas City, Mexico & Orient from Alpine, Tex., to the Rio Grande river at Presidio will be taken over by the Atchison, Topeka & Santa Fe on November 1. Service over the new line will be inaugurated on that date by the operation of an excursion train from San Angelo, Tex., to Mexico City over the Santa Fe, the Kansas City, Mexico & Orient and the National of Mexico. The line between Paisano, Tex., and Presidio, 73 miles, will be designated as the Presidio district of the Slaton division. Between Alpine and Paisano, 11 miles, operation will be over the Southern Pacific under a trackage agreement.

Coroner Finds Byers Murdered

According to the verdict returned by Dr. Otto M. Reinhardt, acting coroner, of Baltimore, Maxwell C. Byers, president and chairman of the board of directors of the Western Maryland, was murdered by Dudley G. Gray, vice-president in charge of traffic of the same road, who subsequently committed suicide.

These two Western Maryland officers, as reported in the *Railway Age* of September 27, page 644, died of bullet wounds on September 23 in the general offices of the company at Baltimore. Mr. Byers died immediately and Mr. Gray a few

hours later at a nearby hospital to which he had been removed. Following the tragedy the Western Maryland issued a statement which said, "Mr. Byers and Mr. Gray have been officials of the Western Maryland Railway for fifteen years or more. While they frequently differed sharply on matters of policy in connection with the company's affairs, we never knew them to have any serious personal differences. Those in the president's office state that they never knew Mr. Byers to carry a pistol or to keep one in his office, and so far as we know Mr. Byers was unarmed at the time of the shooting."

Photographs and biographical sketches of Mr. Byers and Mr. Gray were published in the aforementioned item appearing in the *Railway Age* of September 27.

Brookhart Criticizes Sargent Speech

Senator Brookhart, of Iowa, has issued to the press a statement commenting upon the address by F. W. Sargent, president of the Chicago & North-Western, before the American Bankers' Association at Cleveland on October 2, in which Mr. Sargent criticized the government policy of subsidizing waterway and highway competition with the railways. "This statement," Senator Brookhart said, "is tantamount to a declaration of war upon the whole plan of inland waterway improvement. Mr. Sargent is an able lawyer and attacks upon the ground that it is unconstitutional. This attack is not mere idle vamping, but the mature thought of the shrewdest lawyers in the country, and means that every legal artifice will be used to stop the improvement of our rivers in competition with the railroads." Senator Brookhart continued, saying that "nobody could be more fully estopped by moral right from making such a claim on either the ground

(Continued on page 776)



A Nineteenth Century Bridge and a Twentieth Century Highway

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1930

Name of road	Av. mileage operated during period.	Operating revenues			Operating expenses			Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income, 1929.
		Freight.	Passenger.	Total.	Traffic.	Trans- portation.	General.					
Akron, Canton & Youngstown.....	Aug. 171	\$224,644	\$153	\$224,797	32,740	18,831	13,780	62,209	15,199	142,073	\$83,024	\$63,780
Akron, Canton & Youngstown.....	8 mos. 171	1,893,588	911	1,904,499	314,628	184,751	115,656	544,629	142,795	1,291,976	356,661	708,820
Akron, Canton & Youngstown.....	8 mos. 171	1,893,588	911	1,904,499	314,628	184,751	115,656	544,629	142,795	1,291,976	356,661	708,820
Atchison, Topeka & Santa Fe.....	Aug. 9,629	12,443,954	2,430,977	14,874,931	2,000,342	2,791,634	380,357	4,492,433	416,412	10,062,225	4,536,889	37,603,804
Atchison, Topeka & Santa Fe.....	8 mos. 9,630	91,086,525	20,592,030	111,678,555	20,609,318	25,638,130	3,364,499	37,745,816	3,594,022	90,721,310	21,838,554	1,246,197
Atchison, Topeka & Santa Fe.....	8 mos. 9,630	91,086,525	20,592,030	111,678,555	20,609,318	25,638,130	3,364,499	37,745,816	3,594,022	90,721,310	21,838,554	1,246,197
Gulf, Colorado & Santa Fe.....	Aug. 1,976	2,122,257	154,694	2,276,951	207,518	400,960	54,145	678,720	74,710	1,406,202	892,571	763,027
Gulf, Colorado & Santa Fe.....	8 mos. 1,949	14,882,080	1,139,026	16,021,106	3,423,312	3,696,556	458,005	5,332,168	604,225	13,406,386	2,815,051	1,673,927
Gulf, Colorado & Santa Fe.....	8 mos. 1,949	14,882,080	1,139,026	16,021,106	3,423,312	3,696,556	458,005	5,332,168	604,225	13,406,386	2,815,051	1,673,927
Panhandle & Santa Fe.....	Aug. 1,385	9,311,562	644,045	9,955,607	1,281,133	2,191,541	19,226	3,008,110	317,512	7,947,595	551,742	557,837
Panhandle & Santa Fe.....	8 mos. 1,385	9,311,562	644,045	9,955,607	1,281,133	2,191,541	19,226	3,008,110	317,512	7,947,595	551,742	557,837
Atlanta & West Point.....	Aug. 93	126,758	34,098	160,856	28,870	35,109	11,460	77,484	12,430	169,423	130,995	35,104
Atlanta & West Point.....	8 mos. 93	1,077,090	324,674	1,401,764	204,458	296,781	96,247	644,927	97,660	1,378,011	35,877	101,461
Atlanta & West Point.....	8 mos. 93	1,077,090	324,674	1,401,764	204,458	296,781	96,247	644,927	97,660	1,378,011	35,877	101,461
Western of Alabama.....	Aug. 133	1,209,621	345,385	1,555,006	229,507	357,656	98,908	612,068	104,284	1,434,105	176,538	220,810
Western of Alabama.....	8 mos. 133	1,209,621	345,385	1,555,006	229,507	357,656	98,908	612,068	104,284	1,434,105	176,538	220,810
Atlanta, Birmingham & Coast.....	Aug. 639	308,162	25,340	333,502	77,107	79,361	27,020	141,059	18,946	354,625	31,869	30,145
Atlanta, Birmingham & Coast.....	8 mos. 639	2,353,691	143,220	2,496,911	664,183	620,934	228,824	1,199,021	160,746	2,960,054	195,196	168,430
Atlanta, Birmingham & Coast.....	8 mos. 639	2,353,691	143,220	2,496,911	664,183	620,934	228,824	1,199,021	160,746	2,960,054	195,196	168,430
Atlantic Coast Line.....	Aug. 5,159	2,936,059	514,296	3,450,355	777,609	992,384	179,107	1,658,903	161,543	3,796,713	415,705	230,475
Atlantic Coast Line.....	8 mos. 5,155	31,201,994	8,355,438	39,557,432	6,648,672	8,367,266	1,372,920	15,468,132	1,415,147	33,770,050	5,543,540	10,652,384
Charleston & Western Carolina.....	Aug. 342	193,570	9,292	202,862	26,913	36,035	7,838	82,952	7,205	161,013	32,578	31,869
Charleston & Western Carolina.....	8 mos. 342	1,774,325	63,975	1,838,300	430,876	296,693	59,222	713,209	58,103	1,558,225	195,196	168,430
Charleston & Western Carolina.....	8 mos. 342	1,774,325	63,975	1,838,300	430,876	296,693	59,222	713,209	58,103	1,558,225	195,196	168,430
Baltimore & Ohio.....	Aug. 5,658	15,542,471	1,653,254	17,195,725	2,000,521	3,272,073	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
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Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....	8 mos. 5,658	119,703,453	12,889,585	132,593,038	16,434,663	29,771,014	4,268,625	49,643,593	5,511,990	107,063,961	27,725,273	25,845,160
Baltimore & Ohio.....												

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1930—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net % operating income	Net % operating income, 1929
		Freight	Passenger (inc. misc.)	Total	Maintenance of way and structures	Traffic	Transportation					
Chicago & Illinois Midland.....	Aug. 131	\$245,692	\$3,738	\$259,971	\$27,223	\$26,800	\$68,329	73.4	\$190,737	\$60,234	\$60,234	\$56,654
Chicago & North Western.....	Aug. 131	1,877,766	9,423	1,993,204	233,729	233,729	577,503	79.8	1,501,585	336,888	336,888	300,340
Chicago & North Western.....	Aug. 8458	9,315,512	1,901,233	12,551,220	1,845,083	2,335,695	2,335,695	70.4	8,833,496	2,988,386	2,988,386	2,621,509
Chicago & North Western.....	8 mos.	64,844,620	13,742,599	88,427,338	13,015,672	18,043,673	33,986,864	79.4	70,240,128	12,059,738	10,303,667	18,525,034
Chicago, Burlington & Quincy.....	Aug. 9,325	11,045,663	1,632,728	13,929,233	2,388,987	2,824,413	3,973,681	64.0	8,918,074	3,911,530	3,590,898	4,234,405
Chicago, Burlington & Quincy.....	8 mos.	73,067,964	10,851,634	94,079,294	14,052,925	24,844,201	31,537,909	70.2	66,032,263	20,437,031	18,472,303	22,002,328
Chicago Great Western.....	Aug. 1,495	1,671,198	191,516	2,010,007	353,146	70,671	709,037	69.4	1,304,927	615,080	354,173	47,948
Chicago Great Western.....	8 mos.	12,411,083	1,413,661	14,984,757	2,184,568	680,681	5,972,533	75.2	11,375,750	2,920,203	1,523,669	1,489,718
Chicago, Indianapolis & Louisville.....	Aug. 645	973,958	123,213	1,213,228	150,922	30,801	435,564	75.2	911,853	219,399	98,151	321,669
Chicago, Indianapolis & Louisville.....	8 mos.	8,084,595	1,051,980	10,125,177	1,163,837	310,763	3,750,555	76.1	7,708,738	1,773,670	797,678	1,173,884
Chicago, Mil., St. Paul & Pacific.....	Aug. 11,335	11,038,144	1,313,092	13,611,921	1,902,426	326,802	4,466,425	69.1	9,401,680	3,381,444	2,961,402	3,424,403
Chicago, Mil., St. Paul & Pacific.....	8 mos.	77,149,160	8,934,797	95,683,657	15,644,223	2,670,592	36,107,410	80.4	18,786,448	12,306,079	9,322,447	16,457,573
Chicago River & Indiana.....	Aug. 20	.....	.....	512,872	43,000	2,114	168,843	52.8	270,793	226,133	283,777	330,666
Chicago River & Indiana.....	8 mos.	.....	.....	4,146,480	384,000	1,596	1,473,055	57.5	2,368,929	1,502,197	2,062,916	2,378,408
Chicago, Rock Island & Pacific.....	Aug. 7,592	8,304,034	1,289,704	10,470,475	1,368,510	235,282	3,439,453	65.8	8,897,128	2,897,128	2,473,152	3,267,840
Chicago, Rock Island & Pacific.....	8 mos.	62,167,859	10,277,769	80,046,626	10,566,735	2,004,607	29,766,590	75.2	19,877,382	13,287,774	11,684,820	13,439,083
Chicago, Rock Island & Gulf.....	Aug. 566	467,464	47,403	553,008	77,627	170,694	19,467	60.0	331,977	202,516	153,096	423,181
Chicago, Rock Island & Gulf.....	8 mos.	3,863,720	466,222	4,687,306	643,592	1,722,900	1,589,365	64.3	3,013,269	1,489,244	1,138,923	1,784,027
Chic. St. Paul, Minn. & Omaha.....	Aug. 1,746	1,966,618	349,262	2,505,880	358,083	39,436	1,790,963	71.6	1,711,843	592,644	492,991	605,291
Chic. St. Paul, Minn. & Omaha.....	8 mos.	13,068,657	2,295,142	16,705,987	2,440,191	6,972,275	684,231	82.1	2,983,122	2,116,583	1,505,479	2,061,878
Clinchfield Railroad.....	Aug. 309	430,153	9,286	448,946	54,036	19,455	100,895	69.1	310,398	68,468	102,730	231,969
Clinchfield Railroad.....	8 mos.	3,919,798	79,400	4,079,354	481,999	171,156	891,342	66.5	2,712,484	806,701	1,266,998	1,680,338
Colorado & Southern.....	Aug. 1,038	647,559	101,728	828,230	126,656	14,848	307,938	80.0	165,946	96,014	71,382	95,106
Colorado & Southern.....	8 mos.	5,430,672	514,676	6,616,371	1,042,336	131,439	2,429,619	80.0	1,322,435	761,937	584,779	564,169
Ft. Worth & Denver City.....	Aug. 696	556,718	127,749	738,269	104,380	22,935	37,415	69.0	509,105	183,360	165,317	370,637
Ft. Worth & Denver City.....	8 mos.	5,168,680	902,116	6,552,786	918,477	172,442	2,063,125	70.9	4,649,135	1,533,506	1,417,551	2,213,184
Wichita Valley.....	Aug. 270	49,168	2,027	55,195	27,008	3,936	25,358	106.2	3,414	-10,585	-26,960	25,521
Wichita Valley.....	8 mos.	485,646	22,676	545,411	203,272	326	231,875	89.9	55,246	-1,474	-15,178	130,742
Columbus & Greenville.....	Aug. 167	107,020	11,345	124,315	32,913	4,890	47,306	94.3	117,215	4,062	2,229	9,936
Columbus & Greenville.....	8 mos.	906,210	105,699	1,074,587	267,251	33,760	385,493	87.3	737,805	104,304	85,397	68,414
Conemaugh & Black Lick.....	Aug. 20	69,389	.....	112,307	13,159	55,959	55,959	79.2	88,901	23,406	25,873	58,221
Conemaugh & Black Lick.....	8 mos.	582,205	.....	1,053,980	100,919	7,021	599,070	86.3	909,120	136,860	160,383	267,432
Delaware & Hudson.....	Aug. 881	2,756,395	369,312	3,359,521	470,797	56,302	1,087,010	74.3	2,496,938	739,533	769,532	789,147
Delaware & Hudson.....	8 mos.	21,422,679	1,932,563	25,056,057	3,614,202	470,679	9,063,371	81.7	4,586,925	3,601,704	3,594,862	4,734,961
Delaware, Lackawanna & Western.....	Aug. 998	3,956,611	965,193	5,936,315	607,447	144,212	2,306,765	71.5	1,137,387	1,190,046	1,190,046	1,190,046
Delaware, Lackawanna & Western.....	8 mos.	33,959,105	6,921,871	46,746,142	4,684,412	1,180,150	19,244,172	75.9	11,242,706	7,229,801	7,229,801	10,667,527
Denver & Rio Grande Western.....	Aug. 2,561	2,098,500	328,141	2,641,181	382,192	58,847	795,369	68.4	1,807,329	653,643	648,602	776,353
Denver & Rio Grande Western.....	8 mos.	15,285,088	1,875,088	18,608,747	2,597,298	472,630	5,785,572	73.0	13,533,849	3,631,932	3,821,277	4,888,233
Denver & Salt Lake.....	Aug. 232	233,936	12,404	277,525	100,802	2,145	41,692	73.7	204,459	56,066	60,057	160,195
Denver & Salt Lake.....	8 mos.	1,613,490	111,302	1,864,862	484,129	18,846	327,831	75.7	1,411,334	329,426	393,823	770,590
Detroit & Mackinac.....	Aug. 242	83,930	9,099	102,538	42,731	1,768	35,439	87.8	90,046	3,923	3,739	16,113
Detroit & Mackinac.....	8 mos.	610,328	63,661	742,866	212,776	17,283	284,321	91.8	61,054	3,679	2,397	212,222
Detroit & Toledo Shore Line.....	Aug. 50	229,926	.....	233,500	37,545	7,195	66,299	72.1	190,475	147,073	126,615	57,475
Detroit & Toledo Shore Line.....	8 mos.	2,585,422	.....	2,621,514	307,971	61,747	670,930	53.3	1,223,429	1,024,787	522,561	648,346
Detroit Terminal.....	Aug. 19	.....	.....	112,083	23,571	34	48,665	76.9	86,169	10,718	12,145	54,226
Detroit Terminal.....	8 mos.	.....	.....	1,010,102	147,176	83	508,569	78.4	791,653	94,352	102,182	535,637
Detroit, Toledo & Ironton.....	Aug. 496	662,265	2,003	683,020	109,276	13,350	218,415	72.1	190,475	147,073	126,615	57,475
Detroit, Toledo & Ironton.....	8 mos.	7,657,687	13,876	7,813,392	1,034,751	107,831	2,026,254	55.4	3,481,225	2,992,167	2,708,611	3,818,647
Duluth, Missabe & Northern.....	Aug. 568	3,087,617	8,017	3,494,679	303,041	4,026	496,353	33.0	1,152,581	2,342,098	2,113,633	3,148,516
Duluth, Missabe & Northern.....	8 mos.	13,341,087	53,643	15,152,395	2,117,610	33,297	7,895,527	52.1	7,256,868	5,746,928	5,773,428	9,580,408
Duluth, Winnipeg & Pacific.....	Aug. 178	112,299	14,543	136,065	41,557	4,644	57,092	112.6	153,236	-17,171	-18,096	28,321
Duluth, Winnipeg & Pacific.....	8 mos.	1,092,480	89,747	1,254,932	252,202	40,830	530,664	96.4	1,210,167	-19,406	-4,920	215,145
Elgin, Joliet & Eastern.....	Aug. 452	1,518,543	42	1,692,559	247,451	15,042	670,497	39.7	1,021,139	903,773	780,373	655,587
Elgin, Joliet & Eastern.....	8 mos.	12,247,997	2,347	15,705,726	1,763,140	127,995	5,904,658	68.3	4,979,880	4,030,560	2,670,509	4,268,894
Erie Railroad.....	Aug. 2,046	6,652,684	931,405	8,272,573	1,150,744	175,147	3,066,687	77.2	1,884,697	1,486,745	1,370,631	2,004,487
Erie Railroad.....	8 mos.	52,342,325	6,551,975	64,485,532	7,961,077	1,442,068	25,151,615	80.7	12,459,497	9,269,518	8,622,205	12,705,541
Chicago & Erie.....	Aug. 269	941,064	54,935	1,075,484	158,373	28,394	327,544	64.9	698,257	319,071	50,689	299,606
Chicago & Erie.....	8 mos.	7,950,971	432,043	9,074,084	1,089,757	238,747	2,761,949	61.0	3,540,469	3,075,075	902,556	1,777,199

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1930—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Net from railway operation	Operating ratio	Operating income (or loss)	Net operating income, 1929
		Freight	Passenger (inc. misc.)	Total	Maintenance of way and structures	Traffic	Trans- portation	General	Total				
New Jersey & New York.....Aug. 45	45	\$22,379	\$94,135	\$116,514	\$18,152	\$1,396	\$59,662	\$3,351	\$98,754	\$21,914	81.8	\$17,579	\$19,972
.....8 mos. 45	45	183,369	740,744	924,113	174,201	12,936	502,050	30,418	845,188	116,475	87.9	79,649	164,853
.....Aug. 131	131	322,047	1,512,422	1,834,469	422,256	4,876	1,593,333	11,130	2,027,762	125,546	88.1	93,723	202,051
N. Y. Susquehanna & Western.....Aug. 131	131	2,499,007	320,003	2,819,010	372,106	39,394	1,354,858	95,525	2,252,580	850,870	72.6	598,158	397,103
.....8 mos. 131	131	19,997,007	2,400,003	22,397,010	2,819,010	39,394	1,354,858	95,525	2,252,580	850,870	72.6	598,158	397,103
Florida East Coast.....Aug. 863	863	395,626	115,965	511,591	139,233	27,135	214,522	46,633	604,918	19,035	103.2	1,622,963	1,065,546
.....8 mos. 863	863	4,708,266	2,934,520	7,642,786	1,253,333	244,407	2,500,405	362,210	6,172,053	2,636,580	70.1	9,814	623
Fort Smith & Western.....Aug. 249	249	84,232	6,708	91,000	17,680	5,231	35,402	6,542	83,648	103,479	86.2	75,138	13,931
.....8 mos. 249	249	751,278	54,298	805,576	171,499	44,923	311,816	52,398	749,478	87.3	88.3	75,138	13,931
Galveston Wharf.....Aug. 13	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....8 mos. 13	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia R. R. ....Aug. 328	328	2,554,908	342,924	2,897,832	364,600	179,562	1,373,551	181,974	2,716,485	418,465	86.7	349,124	458,082
.....8 mos. 328	328	2,554,908	342,924	2,897,832	364,600	179,562	1,373,551	181,974	2,716,485	418,465	86.7	349,124	458,082
Georgia & Florida.....Aug. 469	469	241,970	4,941	246,911	43,941	11,112	62,440	7,489	149,531	103,880	59.0	95,180	86,099
.....8 mos. 469	469	1,030,134	46,352	1,076,486	174,068	33,147	230,945	51,913	774,996	363,300	68.1	175,290	177,940
Grand Trunk Western.....Aug. 1,019	1,019	1,645,130	183,586	1,828,716	350,122	21,660	1,64,058	21,969	316,193	63,485	83.3	54,689	67,771
.....8 mos. 1,019	1,019	16,124,670	1,369,781	17,494,451	2,770,305	574,782	7,675,357	829,490	15,490,528	3,297,332	82.5	2,122,082	698,052
Atlantic & St. Lawrence.....Aug. 166	166	118,467	27,012	145,479	35,360	5,457	80,037	8,800	160,510	121,919	99.2	11,381	56,378
.....8 mos. 166	166	1,026,474	174,068	1,200,542	269,328	48,456	713,331	70,297	1,446,578	1,446,578	108.4	225,396	624,248
Great Northern.....Aug. 8,366	8,366	52,242,409	6,352,514	58,594,923	10,700,859	2,015,223	22,361,124	1,931,012	50,401,353	13,104,349	76.9	9,235,797	8,538,045
.....8 mos. 8,366	8,366	52,242,409	6,352,514	58,594,923	10,700,859	2,015,223	22,361,124	1,931,012	50,401,353	13,104,349	76.9	9,235,797	8,538,045
Green Bay & Western.....Aug. 234	234	129,501	2,696	132,197	33,955	6,366	49,936	2,903	117,774	21,968	84.2	12,453	9,296
.....8 mos. 234	234	1,114,093	23,158	1,137,251	201,604	50,417	430,678	23,377	890,643	286,691	75.6	231	171,945
Gulf & Ship Island.....Aug. 307	307	153,536	205,279	358,815	48,946	4,571	729,951	54,506	1,536,870	297,652	83.8	38,466	70,032
.....8 mos. 307	307	1,379,142	239,526	1,618,668	388,114	38,285	7,299,951	54,506	1,536,870	297,652	83.8	38,466	70,032
Gulf, Mobile & Northern.....Aug. 733	733	422,092	20,926	443,018	88,327	27,688	152,494	22,632	360,623	102,029	77.95	70,767	45,854
.....8 mos. 733	733	3,689,396	180,246	3,869,642	676,625	244,673	1,333,833	212,657	3,196,063	849,727	79.0	605,593	366,459
Illinois Central.....Aug. 5,018	5,018	8,127,043	1,349,420	9,476,463	1,799,518	258,685	3,737,317	310,611	7,884,811	2,351,186	77.2	1,635,953	1,532,629
.....8 mos. 5,018	5,018	66,819,951	11,921,324	78,741,275	10,269,425	2,142,649	32,210,998	2,916,029	68,087,251	17,889,864	79.0	12,838,029	11,725,578
Yazoo & Mississippi Valley.....Aug. 1,705	1,705	1,350,459	216,944	1,567,403	293,563	315,754	703,991	63,323	1,430,479	247,994	85.2	109,007	234,255
.....8 mos. 1,705	1,705	12,783,434	1,880,013	14,663,447	2,422,022	361,304	6,246,263	522,327	12,884,073	3,290,259	79.0	1,495,577	2,397,439
Illinois Central System.....Aug. 6,724	6,724	9,477,502	1,566,364	11,043,866	2,601,060	2,503,953	38,491,308	3,439,064	80,538,881	21,188,910	79.2	12,838,029	16,740,321
.....8 mos. 6,724	6,724	79,653,464	13,817,598	93,471,062	12,691,425	2,503,953	38,491,308	3,439,064	80,538,881	21,188,910	79.2	12,838,029	16,740,321
Illinois Terminal.....Aug. 548	548	525,880	106,793	632,673	97,480	20,495	198,993	37,689	432,250	229,279	65.34	194,675	152,927
.....8 mos. 548	548	3,797,280	979,272	4,776,552	620,945	154,916	1,753,825	76,447	1,001,659	69,95	61.7	523,044	447,269
Kansas City Southern.....Aug. 784	784	1,413,236	74,442	1,487,678	230,609	68,213	429,699	64,878	8,003,507	3,781,224	67.9	2,922,905	2,427,620
.....8 mos. 784	784	10,053,975	574,537	10,628,512	1,343,053	510,384	3,498,248	64,878	8,003,507	91,798	60.7	91,798	45,353
Texarkana & Ft. Smith.....Aug. 99	99	178,438	5,212	183,650	25,122	9,043	56,760	9,700	141,857	689,589	60.6	594,352	327,785
.....8 mos. 99	99	1,517,375	43,810	1,561,185	221,741	71,246	452,736	91,626	1,058,678	689,589	60.6	594,352	327,785
Kansas, Oklahoma & Gulf.....Aug. 326	326	2,416,663	1,720	2,418,383	30,278	1,792	55,141	11,558	135,048	113,790	54.3	89,794	70,688
.....8 mos. 326	326	19,995,549	15,749	20,011,298	238,752	126,694	508,125	91,897	1,137,349	897,680	56.3	727,253	564,955
Lake Superior & Ishpeming.....Aug. 160	160	293,589	526	294,115	41,090	606	58,374	6,182	129,918	213,918	37.8	174,280	205,960
.....8 mos. 160	160	1,414,600	7,066	1,421,666	285,670	4,885	361,336	50,085	90,534	720,012	56.1	469,312	444,407
Lake Terminal.....Aug. 12	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....8 mos. 12	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh & Hudson River.....Aug. 96	96	182,983	1,225	184,208	16,232	3,278	64,641	9,001	118,107	74,605	61.3	54,486	37,308
.....8 mos. 96	96	1,412,456	8,409	1,420,865	195,319	27,878	540,220	80,610	1,081,960	421,067	72.0	302,824	178,487
Lehigh & New England.....Aug. 216	216	473,925	1,116	475,041	63,789	6,741	146,698	31,112	332,328	149,211	69.0	130,261	119,644
.....8 mos. 216	216	3,664,085	7,232	3,671,317	421,553	55,469	1,168,043	192,448	2,512,446	805,052	75.7	697,031	563,017
Lehigh Valley.....Aug. 1,361	1,361	4,163,986	564,086	4,728,072	511,502	140,647	2,024,978	137,252	3,943,394	1,169,108	77.1	871,715	775,959
.....8 mos. 1,361	1,361	33,789,472	3,900,475	37,689,947	3,909,857	1,158,195	17,164,193	1,488,915	35,232,808	8,468,840	79.3	6,078,417	5,283,638
Louisiana & Arkansas.....Aug. 608	608	511,555	18,067	529,622	79,088	23,904	171,256	14,814	400,278	1,551,111	72.1	110,089	80,402
.....8 mos. 608	608	4,463,786	161,045	4,624,831	739,784	174,173	1,454,153	209,338	3,354,960	1,481,940	69.4	1,113,339	774,591
Louisiana, Arkansas & Texas.....Aug. 202	202	59,675	64,935	124,610	12,104	4,390	30,186	4,496	65,034	100.2	100.2	—4,196	—18,613
.....8 mos. 202	202	567,659	16,525	584,184	117,330	26,042	288,045	42,837	654,355	46,349	107.6	—78,527	—171,772
Louisville & Nashville.....Aug. 5,252	5,252	7,435,388	967,683	8,403,071	1,365,617	226,855	3,214,769	368,640	7,420,909	1,529,888	82.9	1,002,036	2,055,915
.....8 mos. 5,252	5,252	63,171,911	8,392,158	71,564,069	12,326,149	1,973,818	27,947,736	2,957,627	64,984,486	11,554,919	84.9	7,381,017	7,572,783
Maine Central.....Aug. 1,121	1,121	1,092,195	312,833	1,405,028	263,564	20,318	577,633	48,902	1,201,734	383,968	75.8	286,418	275,689
.....8 mos. 1,121	1,121	9,872,096	1,932,519	11,804,615	2,017,151	141,627	4,842,910	404,675	9,822,703	3,140,632	75.8	2,364,917	1,996,715

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1930—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net operating income, 1929	Net operating income, 1930
		Freight	Passenger (inc. misc.)	Total	Way and structures	Maintenance of equipment	Traffic					
Midland Valley	363	\$262,690	\$5,298	\$267,988	\$47,141	\$26,247	\$5,324	55.4	\$123,329	\$108,455	\$89,834	\$113,331
Minneapolis & St. Louis	363	1,880,430	19,049	1,899,479	1,993,346	247,335	44,868	59.8	801,334	683,882	550,993	646,386
Minneapolis & St. Louis	1,627	7,486,832	411,968	7,898,800	1,159,879	1,703,673	304,410	87.5	1,053,297	559,676	223,553	352,866
Minneapolis, St. Paul & S. S. Marie	4,374	3,123,622	414,649	3,538,271	490,621	629,024	83,507	68.7	1,220,014	973,623	805,802	1,211,906
Duluth, South Shore & Atlantic	573	231,788	41,051	272,839	40,777	5,362,683	659,285	82.0	4,705,208	2,861,221	1,697,776	5,216,420
Spokane International	165	89,015	6,857	95,872	102,407	19,060	3,409	64.0	36,913	31,886	25,403	46,189
Mississippi Central	150	823,185	52,380	875,565	636,645	138,349	27,743	79.8	128,315	87,719	44,302	157,692
Missouri & North Arkansas	364	1,014,015	50,348	1,064,363	1,097,779	10,706	9,680	68.2	34,925	27,243	22,093	36,803
Missouri-Illinois	202	1,213,538	13,136	1,226,674	125,184	175,252	79,375	79.5	183,072	129,638	124,264	233,022
Missouri-Kansas-Texas Lines	3,188	3,223,468	387,241	3,610,709	484,958	626,107	123,770	88.6	1,640,202	14,002	19	-6,410
Missouri Pacific	3,188	23,767,055	3,447,328	27,214,383	4,025,746	5,128,266	992,653	85.2	166,135	146,594	40,148	13,019
Gulf Coast Lines	1,026	960,678	96,818	1,057,496	1,853,884	1,877,317	368,222	66.1	3,794,113	3,406,847	2,627,300	3,116,226
International-Great Northern	1,159	1,021,878	137,125	1,159,003	1,273,167	210,162	36,551	79.8	256,213	212,569	151,095	235,850
San Antonio, Uvalde & Gulf	318	166,051	16,492	182,543	38,824	19,423	5,521	62.8	71,236	66,688	39,295	7,557
Mobile & Ohio	318	1,053,308	128,250	1,181,558	317,322	1,282,954	48,608	69.7	389,006	351,288	135,866	115,849
Monongahela	1,159	971,416	69,993	1,041,409	1,811,010	1,799,414	51,652	80.3	217,039	127,645	63,752	286,727
Monongahela Connecting	6	8,700,389	533,825	9,234,214	1,493,201	1,835,215	451,518	80.7	1,885,635	1,187,249	676,845	1,680,646
Montour	177	495,546	4,730	500,276	65,000	55,000	1,404	50.7	248,399	226,720	131,682	169,150
Nashville, Chatt. & St. Louis	1,203	1,250,381	174,877	1,425,258	4,202,046	615,000	10,404	55.8	1,855,903	1,708,826	908,420	1,366,825
Nevada Northern	165	52,827	1,928	54,755	12,086	4,550	936	54.6	28,280	20,265	21,856	42,389
Newburgh & South Shore	165	452,184	24,385	476,569	101,141	45,277	8,268	57.5	227,548	156,309	162,301	451,532
New Orleans Great Northern	264	222,623	16,746	239,369	35,740	36,396	13,611	68.2	78,263	63,146	37,958	45,394
New Orleans Terminal	269	1,771,190	113,565	1,884,755	232,854	335,847	62,832	70.7	569,942	449,210	206,476	289,443
New York Central	11,477	24,443,744	10,128,502	34,572,246	5,859,426	8,534,763	785,687	78.5	8,508,764	5,557,498	4,385,692	10,916,137
Indiana Harbor Belt	120	209,803,848	77,147,252	286,951,100	43,110,018	71,623,277	6,459,862	78.2	71,397,523	47,652,503	41,021,941	71,427,711
Pittsburgh & Lake Erie	231	2,201,653	150,586	2,352,239	269,561	638,418	30,726	74.2	624,494	476,403	758,009	782,549
New York, Chicago & St. Louis	1,690	17,584,958	1,243,810	18,828,768	2,067,330	5,772,581	303,646	78.8	4,110,364	2,844,838	5,100,471	5,422,963
N. Y., N. Haven & Hartford	2,120	5,125,442	3,662,290	8,787,732	1,496,441	1,401,233	108,842	65.0	3,436,618	3,035,860	2,442,504	3,271,281
New York Connecting	20	171,846	28,677,723	28,849,569	11,546,927	12,420,809	838,453	68.0	25,722,423	20,697,294	16,085,560	20,213,377
New York Ontario & Western	568	659,272	384,858	1,044,130	183,238	164,777	16,392	81.5	382,011	339,381	285,503	778,077

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1930—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Operating income (or loss)	Net ry. operating income, 1929
		Freight	Passenger (inc. misc.)	Total	Maintenance of way and equipment	Traffic	Portation	General	Total				
Norfolk & Western	Aug. 2,240	\$8,075,210	\$361,606	\$8,436,816	\$904,020	\$1,551,594	\$134,629	\$1,990,898	\$2,477,110	55.5	\$3,879,348	\$3,078,766	\$4,244,185
Norfolk Southern	Aug. 2,240	63,438,972	2,738,551	66,177,523	8,450,538	12,816,184	1,041,885	16,437,386	20,222,679	59.8	27,487,135	20,682,947	27,387,789
Norfolk Southern	Aug. 932	469,596	30,368	500,000	36,738	712,035	29,298	1,861,201	2,126,671	84.1	82,396	30,492	123,904
Norfolk Southern	Aug. 932	4,227,277	195,563	4,422,840	679,652	715,760	235,444	1,861,201	3,700,498	79.2	970,313	553,091	882,793
Norfolk Southern	Aug. 932	5,979,852	733,819	6,713,671	826,370	1,522,159	216,085	2,410,869	3,539,088	72.1	2,072,643	1,416,248	2,498,934
Norfolk Southern	Aug. 6,785	41,161,126	5,517,866	46,678,992	7,571,541	11,551,406	2,003,846	19,285,542	20,728,871	83.3	8,697,457	3,320,722	11,547,126
Norfolk Southern	Aug. 441	432,105	1,104,643	1,536,748	48,026	72,198	5,907	235,219	19,300	87.4	258,821	222,944	201,973
Norfolk Southern	Aug. 453	2,371,689	1,104,643	3,476,332	815,322	650,360	61,146	1,672,509	130,644	87.4	481,242	192,634	179,325
Norfolk Southern	Aug. 129	54,718	3,343	58,061	20,327	41,872	10,431	206,492	3,417	87.7	13,054	8,630	10,421
Norfolk Southern	Aug. 129	541,873	41,091	582,964	203,649	60,289	10,431	206,492	3,417	83.2	102,347	67,938	3,894
Norfolk Southern	Aug. 129	34,045,868	10,374,259	44,420,127	6,259,250	8,944,934	767,211	17,479,444	16,370,046	83.2	13,483,124	9,354,505	14,317,751
Norfolk Southern	Aug. 10,878	273,913,592	80,479,731	354,393,323	48,615,630	76,981,714	7,012,792	144,492,048	13,592,742	75.1	97,768,765	72,686,954	62,856,589
Norfolk Southern	Aug. 404	907,701	2,884,767	3,792,468	372,132	390,566	15,284	1,296,731	63,003	53.9	1,831,098	1,333,560	1,233,931
Norfolk Southern	Aug. 404	18,344,598	18,344,598	36,689,196	3,277,776	3,277,776	186,171	10,328,956	537,518	66.7	8,923,981	6,776,733	5,531,078
Norfolk Southern	Aug. 404	16,037	3,181	19,218	11,050	13,050	4,941	53,577	7,495	80.3	27,154	11,418	38,560
Norfolk Southern	Aug. 19	120,641	8,430	129,071	192,304	117,684	41,472	495,060	64,995	82.4	194,575	63,391	228,861
Norfolk Southern	Aug. 2,264	2,914,853	274,066	3,188,919	472,815	601,343	76,382	1,555,574	111,729	71.2	979,551	794,271	693,177
Norfolk Southern	Aug. 2,247	22,819,180	1,606,084	24,425,264	3,748,254	5,344,841	606,309	9,450,287	937,069	77.4	5,880,576	4,597,221	3,344,065
Norfolk Southern	Aug. 102	771,674	31,384	803,058	116,004	17,657	13,486	243,279	52,789	76.4	18,629	18,101	21,284
Norfolk Southern	Aug. 92	327,252	2,572	329,824	12,381	73,371	18,276	59,161	23,860	60.9	139,201	105,161	173,082
Norfolk Southern	Aug. 92	2,405,091	24,352	2,429,443	600,770	178,456	159,441	492,685	165,762	83.2	976,525	738,656	1,157,668
Norfolk Southern	Aug. 98	120,660	730	121,390	24,311	120,660	1,570	40,575	6,821	80.8	24,438	21,672	12,758
Norfolk Southern	Aug. 198	1,027,695	7,532	1,035,227	242,550	213,144	1,404	358,827	53,395	82.8	183,010	160,221	99,696
Norfolk Southern	Aug. 249	82,595	5,416	88,011	35,087	8,225	751	29,634	2,386	80.0	18,967	14,283	16,127
Norfolk Southern	Aug. 249	380,085	47,260	427,345	202,284	55,508	6,924	202,107	20,509	102.1	—10,032	—47,570	—67,976
Norfolk Southern	Aug. 1,455	5,861,881	472,882	6,334,763	1,185,041	1,713,720	90,106	2,710,720	208,024	83.6	9,294,954	7,025,847	10,310,821
Norfolk Southern	Aug. 1,460	50,333,261	4,115,042	54,448,303	8,972,972	14,528,882	778,948	22,670,301	1,788,109	84.0	18,967	14,283	16,127
Norfolk Southern	Aug. 163	104,230	364,807	469,037	53,875	28,644	3,837	219,578	4,932	62.3	188,496	147,305	118,763
Norfolk Southern	Aug. 163	885,671	1,221,109	2,106,780	543,742	186,574	31,326	1,395,040	41,707	96.9	69,792	—260,105	—416,535
Norfolk Southern	Aug. 117	352,188	205,092	557,280	853,037	141,262	10,367	271,501	36,594	83.2	112,433	73,931	60,409
Norfolk Southern	Aug. 117	3,736,087	2,330,547	6,066,634	1,068,647	1,068,647	85,848	2,596,554	309,090	75.8	1,797,273	1,422,079	981,531
Norfolk Southern	Aug. 413	262,573	86,076	348,649	90,343	85,071	10,156	172,608	16,242	80.3	92,334	66,453	70,722
Norfolk Southern	Aug. 413	2,146,671	614,401	2,761,072	657,673	725,981	90,767	1,437,481	133,996	85.4	505,159	329,151	379,781
Norfolk Southern	Aug. 5,304	5,065,071	735,729	5,800,800	853,447	977,406	119,136	2,001,786	211,587	66.7	2,094,825	1,704,712	1,702,789
Norfolk Southern	Aug. 5,304	38,716,430	5,864,051	44,580,481	6,205,062	9,167,239	1,028,066	16,870,924	1,831,449	72.0	13,618,646	10,814,634	10,905,786
Norfolk Southern	Aug. 233	50,097	3,835	53,932	19,355	13,211	2,311	36,519	3,654	124.7	—14,851	—19,257	—26,836
Norfolk Southern	Aug. 233	459,672	34,091	493,763	160,860	121,240	24,353	312,101	32,265	117.0	—95,021	—130,869	—198,389
Norfolk Southern	Aug. 262	171,126	8,453	179,579	5	22,800	5,955	62,211	9,175	70.3	55,216	51,290	22,331
Norfolk Southern	Aug. 262	1,095,467	78,020	1,173,487	188,453	50,273	466,768	143,015	1,057,823	86.0	172,637	139,897	—90,497
Norfolk Southern	Aug. 1,816	1,499,983	76,491	1,576,474	266,893	218,588	101,584	589,174	85,716	74.8	427,401	344,289	198,755
Norfolk Southern	Aug. 1,816	13,678,599	628,815	14,307,414	2,362,101	2,397,812	879,459	5,384,266	764,248	76.8	3,579,644	2,901,182	1,684,961
Norfolk Southern	Aug. 155	46,231	19,161	65,392	14,660	16,060	3,096	23,162	7,398	95.1	207,350	163,835	170,032
Norfolk Southern	Aug. 155	616,287	146,466	762,753	131,497	133,888	30,638	210,624	63,785	73.7	207,350	163,835	170,032
Norfolk Southern	Aug. 4,493	2,785,392	339,076	3,124,468	490,587	702,006	187,005	1,339,443	158,217	84.6	525,903	249,908	261,004
Norfolk Southern	Aug. 4,493	26,526,733	4,221,100	30,747,833	4,656,340	6,107,777	1,609,098	12,638,397	1,392,420	78.7	7,237,042	4,633,756	4,119,206
Norfolk Southern	Aug. 6,731	7,636,026	1,495,723	9,131,749	1,306,413	1,641,396	219,937	3,436,953	342,127	71.2	2,835,204	2,100,316	2,039,583
Norfolk Southern	Aug. 6,731	62,268,773	12,091,533	74,360,306	15,696,632	23,914,606	1,892,798	28,481,606	2,931,604	76.5	19,068,138	13,089,827	11,973,227
Norfolk Southern	Aug. 314	456,731	108,387	565,118	110,033	126,951	19,645	204,318	23,684	80.7	117,406	65,914	99,051
Norfolk Southern	Aug. 314	4,284,510	822,434	5,106,944	5,495,881	1,033,565	1,033,565	1,033,565	1,033,565	81.6	1,011,029	608,085	771,317
Norfolk Southern	Aug. 338	1,239,701	161,481	1,401,182	236,447	311,550	37,345	419,626	52,403	72.2	4,060,260	3,343,859	2,428,622
Norfolk Southern	Aug. 338	10,448,214	1,507,133	12,000,347	2,160,528	2,837,020	324,660	3,722,096	426,700	75.6	3,089,497	2,385,324	2,343,859
Norfolk Southern	Aug. 397	211,603	46,983	258,586	56,471	57,365	1,620	97,928	2,272	78.7	59,227	36,183	43,217
Norfolk Southern	Aug. 397	1,762,701	602,104	2,364,805	520,202	551,454	18,167	927,323	21,515	81.4	476,831	282,504	253,813
Norfolk Southern	Aug. 204	261,732	51,309	313,041	69,779	69,779	116,556	14,000	264,872	79.3	69,532	37,706	100,827
Norfolk Southern	Aug. 204	2,350,984	405,692	2,756,676	473,100	2,947,243	89,006	945,274	116,060	75.6	719,042	287,138	596,721
Norfolk Southern	Aug. 110	55,529	2,710	58,239	22,847	2,896	1,612	24,950	2,744	91.2	5,295	—239	11,365
Norfolk Southern	Aug. 110	630,476	27,763	658,239	164,436	27,214	17,153	230,708	24,739	68.2	216,270	171,011	20,895

Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1930--CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net ry. operating income, 1929
		Freight	Passenger (inc. misc.)	Total	Maintenance of way and structures	Traffic	Transportation				
Southern Pacific	9,127	\$12,104,761	\$3,186,990	\$15,291,751	\$1,921,436	\$382,911	\$5,365,160	67.0	\$5,538,939	\$4,196,739	\$3,752,061
Aug.	8 mos.	1,382,565	24,244,893	25,627,458	16,351,479	3,397,193	4,237,831	72.4	34,938,892	24,615,143	21,279,126
So. Pacific Steamship Lines	507,244	.....	71,638	71,638	17,759	19,339	461,062	95.3	31,936	30,593	30,648
Aug.	8 mos.	4,620,244	431,639	5,051,883	153,379	174,506	3,797,480	106.6	—355,795	—366,730	—346,846
Texas & New Orleans	4,721	4,340,286	728,042	5,068,328	641,463	162,979	1,690,661	68.0	1,746,591	1,388,660	1,123,787
Aug.	8 mos.	32,319,515	5,881,619	38,201,134	6,756,094	1,449,284	13,458,855	78.8	8,755,827	6,232,226	4,038,525
Spokane, Portland & Seattle	554	611,702	106,942	718,644	13,133	3,264	214,147	63.4	284,138	197,530	177,654
Aug.	8 mos.	4,195,662	637,307	4,832,969	830,100	102,148	1,714,726	69.5	1,617,960	922,258	803,832
Tennessee Central	295	235,763	11,337	247,100	43,164	8,931	89,788	74.2	67,214	59,205	39,822
Aug.	8 mos.	1,870,498	86,274	1,956,772	394,624	74,644	739,794	79.7	419,601	368,828	233,483
Terminal R. R. Assn. of St. L.	55	.....	.....	.....	145,955	2,886	366,529	69.5	268,970	145,154	235,355
Aug.	8 mos.	.....	.....	.....	1,049,850	24,588	3,267,013	74.6	1,792,554	926,658	1,640,714
Texas & Pacific	1,955	2,428,602	379,999	2,808,601	453,938	93,602	930,167	68.4	953,178	797,600	585,346
Aug.	8 mos.	20,924,963	3,139,490	24,064,453	3,801,765	718,086	8,285,523	70.0	7,756,370	6,335,382	4,688,555
Texas Mexican	162	668,415	26,518	694,933	16,342	3,294	42,119	76.9	24,950	19,786	14,424
Aug.	8 mos.	.....	.....	.....	130,398	27,536	321,234	85.4	113,013	72,763	11,178
Toledo, Peoria & Western	239	190,576	243	190,819	17,775	14,027	59,148	60.6	77,107	66,081	56,720
Aug.	8 mos.	1,302,054	2,156	1,304,210	154,254	115,011	518,880	79.0	281,020	231,283	156,100
Toledo Terminal	28	.....	.....	.....	13,463	541	40,562	76.1	21,802	11,459	28,429
Aug.	8 mos.	.....	.....	.....	113,290	4,651	372,203	84.3	122,980	11,783	179,580
Ulster & Delaware	128	37,403	54,735	92,138	15,072	1,584	57,997	77.3	28,634	19,034	13,582
Aug.	8 mos.	265,060	139,824	404,884	105,024	11,696	342,177	85.7	99,507	52,307	30,010
Union R. R. of Penna.	45	.....	.....	.....	931,380	149	591,597	63.5	339,783	319,883	385,782
Aug.	8 mos.	.....	.....	.....	728,637	1,290	2,639,955	76.1	1,509,102	1,277,002	1,783,941
Union Pacific	3,765	8,990,282	1,304,366	10,294,648	1,819,917	154,914	2,795,627	57.7	4,707,303	4,098,699	3,527,265
Aug.	8 mos.	51,884,168	8,651,939	60,536,107	7,315,380	1,544,743	19,879,743	70.5	19,793,852	14,492,230	12,843,249
Oregon Short Line	2,539	2,330,724	319,167	2,649,891	549,808	49,898	849,522	70.7	842,768	539,040	420,073
Aug.	8 mos.	16,881,682	2,099,078	18,980,760	3,694,452	455,310	6,468,337	74.6	5,278,352	2,841,916	2,142,127
Oregon-Wash. R. R. & Nav.	2,364	2,000,546	236,637	2,237,183	431,843	70,831	821,428	72.5	671,912	480,761	350,275
Aug.	8 mos.	12,925,092	1,582,452	14,507,544	3,052,011	621,363	6,173,667	83.8	2,696,541	1,074,716	286,655
Los Angeles & Salt Lake	1,229	1,318,471	596,472	1,914,943	288,727	70,371	596,363	72.7	1,590,301	373,408	231,887
Aug.	8 mos.	11,200,092	2,704,753	13,904,845	2,319,862	668,885	4,908,075	75.9	3,715,817	2,451,380	1,447,517
St. Joseph & Grand Island	258	323,959	7,976	331,935	47,144	3,173	103,772	60.1	136,573	113,118	85,910
Aug.	8 mos.	2,127,381	61,953	2,189,334	349,333	27,195	782,759	69.5	695,470	547,198	377,976
Utah	111	80,138	.....	80,138	17,323	348	21,714	92.4	6,104	6,104	—8,339
Aug.	8 mos.	893,541	.....	893,541	163,719	2,866	233,146	78.7	191,628	138,880	31,232
Virginian	561	1,331,379	22,391	1,353,770	129,589	17,675	286,133	50.0	718,760	543,760	627,960
Aug.	8 mos.	10,773,601	181,482	10,955,083	1,278,391	115,891	2,424,287	53.6	5,394,976	4,112,954	4,642,014
Wabash	2,523	35,662,453	479,461	36,141,914	812,344	1,897,192	1,897,192	75.9	1,234,242	989,380	638,070
Aug.	8 mos.	.....	.....	.....	7,336,391	1,545,034	16,910,665	77.9	9,393,610	7,567,659	4,676,670
Ann Arbor	293	379,386	13,181	392,567	40,313	14,430	168,456	74.1	108,692	82,717	56,228
Aug.	8 mos.	3,127,169	96,022	3,223,191	316,001	116,499	1,399,421	77.7	747,010	535,378	327,286
Western Maryland	896	1,387,333	15,264	1,402,597	272,306	38,893	370,379	63.0	567,610	477,612	461,066
Aug.	8 mos.	11,150,960	127,324	11,278,284	2,220,759	330,959	3,174,395	65.5	4,139,731	3,429,731	3,517,052
Western Pacific	1,051	1,312,379	153,447	1,465,826	194,385	66,549	516,254	69.0	505,227	410,259	367,144
Aug.	8 mos.	8,220,642	815,134	9,035,776	1,857,554	562,981	3,761,171	92.9	698,658	—85,953	30,957
Wheeling & Lake Erie	511	1,238,000	17,207	1,255,207	307,553	34,470	390,908	69.9	406,568	278,621	293,197
Aug.	8 mos.	10,949,380	132,426	11,081,806	1,346,391	300,912	3,438,352	69.8	3,580,389	2,500,866	2,557,719
Wichita Falls & Southern	203	64,683	69	64,752	15,231	2,626	22,149	74.98	17,082	11,897	7,083
Aug.	8 mos.	600,863	3,475	611,338	120,740	23,041	205,593	72.31	176,550	134,446	86,760

News

(Continued from page 769)

of confiscation or subsidy" than the railroads, because of the land grants and because, as he said, "the railroads got 5¼ per cent upon a value of over \$7,000,000,000 above the market value of their securities." Later on he said that the "guarantee" has not all been collected "because the people do not have enough in their pockets to pay it, but they have collected an enormous amount of excess rates because of this command of the law."

Low Rates on Maritime Coal Continued

The Canadian Government has extended until March 31, 1932, the period during which coal mined in the Maritime Provinces will be moved into the markets of Ontario and Quebec, under special test freight rates. Announcement of the extension was made by Sir George Perley, acting Prime Minister, at Ottawa last week. The old order-in-council providing for the test rates would lapse on March 31 of next year, if its provisions were not extended. The Cabinet, however, has decided to extend its provisions for another year.

The test rates authorized are divided into two categories. Under the provisions of the order-in-council a temporary blanket rate of \$3 per ton on coal mined in Nova Scotia moving to points in Quebec, was authorized. This rate was applicable only during the period when navigation was closed on the St. Lawrence River. During the same period, coal moving from New Brunswick to Quebec was granted a rate of \$2.10 per ton.

The second rate applicable to Maritime Province coal under the order-in-council, refers to coal which is brought by water carriage to points in Quebec. It provides for a reduction in the freight rate of one-fifth of a cent per ton-mile, for the distance which the coal is moved by rail from the point where it is landed from the vessel inland to its destination. It is provided coal will not be moved inland at a rate which is more than 75 cents a ton less than the regular rate.

Adjustment of the amount which the railways are out of pocket on the coal movement is made following hearings of the Board of Railway Commissioners, the government making good the deficiency, if any.

Safety Program for November

L. G. Bentley, chairman of the Committee on Education of the Safety Section, A. R. A., has issued circular No. 84, proposing that during the month of November safety committees shall give special attention to train service accidents; this is termed "The Big Problem." Moving trains can't think; but men with brains can, and this is the text of the preachment which is set forth in the circular.

Supplementing some pictures illustrating numerous ways in which men take risks, the circular analyzes the statements of employees killed and injured, as re-

corded by the Interstate Commerce Commission, for the year 1929. Calling attention to the fact that trainmen and enginemen are not the only employees suffering injury in this class of accidents, it is stated that the 909 employees killed, in the year, in this general class of causes were in seven different classes of service as shown below:

EMPLOYEES KILLED BY DEPARTMENTS

Class of Service	Employees Killed
Executives, officials and assistants	2
Professional, clerical and general	26
Maintenance of way and structures	287
Maintenance of equipment and stores	74
Transportation (other than train, engine and yard)	29
Transportation (yardmasters, switch-tenders and hostlers)	18
Transportation (train and engine)	473
Total	909

Another analysis shows the class of injury, from which it appears that amputations and fractures make up 18 per cent of the reportable cases; but of the 20,965 items in this list, it appears that 15,213 come under the head of bruises, strains, sprains, cuts or lacerations, three-fourths of the whole being thus of a nature, the severity of which cannot be determined from the record.

The circular contains other data from the Interstate Commerce Commission records and it is proposed to continue the discussion of the subject in future monthly circulars.

Bridge and Building Men to Meet in Louisville

The fortieth annual convention of the American Railway Bridge and Building Association will convene in the Brown hotel, Louisville, Ky., on October 21-23. Although a large portion of the time of the convention will be devoted to the presentation of committee reports, W. R. Cole, president of the Louisville & Nashville, and R. H. Aishton, president of the American Railway Association, among others, will address the meeting. The program follows:

- Tuesday, October 21**
 10:00 a.m. Address: W. R. Cole, president, Louisville & Nashville, Louisville, Ky.
 Address: R. H. Aishton, president, American Railway Association.
 11:00 a.m. President's address: J. S. Huntoon, assistant bridge engineer, M. C., Detroit, Mich.
 11:30 a.m. Report of Committee on the Relative Advantages and Costs of Precast Concrete Crib Walls and Monolithic Walls; T. H. Strate, chairman, engineer track elevation, C. M. St. P. & P., Chicago.
 2:00 p.m. Report of Committee on Masonry Failures—Their Causes and Remedies; A. B. Scowden, chairman, general bridge inspector, B. & O., Cincinnati, Ohio.
 3:00 p.m. Report of Committee on Programming Bridge, Building and Water Service Work; E. C. Neville, chairman, bridge and building master, C. N. R., Toronto, Ont.
 7:30 p.m. Address: Welding Structural Steel; Albert Reichman, division engineer, American Bridge Company, Chicago.
 Paper: Strengthening Des Moines River Bridge; W. R. Roof, bridge engineer, C. G. W., Chicago.
Wednesday
 9:30 a.m. Report of Committee on the Use of Power Tools and Equipment in Bridge and Building Work; R. D. Ransom, chairman, supervisor bridges and buildings, C. & N. W., Sioux City, Iowa.
 10:30 a.m. Report of Committee on Camp Cars and Their Equipment for Bridge and Building Crews; C. M. Burpee, chair-

- man, engineer, purchasing department, D. & H., Albany, N. Y.
 2:00 p.m. Report of Committee on the Inspection and Maintenance of Water Tanks and Their Appurtenances; E. H. Brown, chairman, supervisor bridges and buildings, N. P., Minneapolis, Minn.
 3:00 p.m. Report of Committee on the Modernizing of Station Buildings; F. H. Soothill, chairman, chief estimator, I. C., Chicago.
 6:30 p.m. Annual banquet.

Thursday

- 9:00 a.m. Report of Committee on the Maintenance of Turntable and Drawbridge Machinery; A. E. Bechtelheimer, chairman, assistant bridge engineer, C. & N. W., Chicago.

N. R. A. A. Makes Space Assignments for March Exhibit

The board of directors of the National Railway Appliances Association has assigned space to 151 member-companies of the association, which will present its annual exhibit at the Coliseum, Chicago, on March 9-12, 1931, coincident with the convention of the American Railway Engineering Association. As reported by C. W. Kelly, secretary-treasurer, 1014 South Michigan avenue, these companies include:

- Adams & Westlake Co., Chicago.
 Adams Motor & Manufacturing Co., Chicago.
 Air Reduction Sales Company, New York.
 American Cable Company, New York.
 American Chain Company, Bridgeport, Conn.
 American Fork & Hoe Co., Cleveland, Ohio.
 American Hoist & Derrick Co., St. Paul, Minn.
 American Railway Hydrant & Valve Co., Stapleton, S. I., N. Y.
 American Steel & Wire Co., Chicago.
 American Valve & Meter Co., Cincinnati, Ohio.
 Armco Culvert Manufacturers' Association, Middletown, Ohio.
 Barber Asphalt Company, Philadelphia, Pa.
 Barrett Company, New York.
 Bethlehem Steel Company, Bethlehem, Pa.
 Binks Manufacturing Company, Chicago.
 Boss Bolt & Nut Co., Chicago.
 Bucyrus-Erie Company, South Milwaukee, Wis.
 Buda Company, Harvey, Ill.
 Carey Company, Philip, Cincinnati, Ohio.
 Carnegie Steel Company, Pittsburgh, Pa.
 Chicago Bridge & Iron Works, Chicago.
 Chicago Pneumatic Tool Company, New York.
 Chipman Chemical Engineering Company, Bound Brook, N. J.
 Cleveland Frog & Crossing Co., Cleveland, Ohio.
 Copperweld Steel Company, Glassport, Pa.
 Creepcheck Company, New York.
 Crerar, Adams & Co., Chicago.
 Cullen-Friedstedt Company, Chicago.
 Curtin-Howe Corporation, New York.
 Cyclone Fence Company, Waukegan, Ill.
 Dearborn Chemical Company, Chicago.
 Detroit Graphite Company, Detroit, Mich.
 DeVilbiss Company, Toledo, Ohio.
 Dickinson, Inc., Paul, Chicago.
 Duff-Norton Manufacturing Company, Pittsburgh, Pa.
 Edison Storage Battery Company, Orange, N. J.
 Edison, Thomas A., Inc., Bloomfield, N. J.
 Electric Railweld Sales Corporation, Chicago.
 Electric Service Supplies Company, Philadelphia, Pa.
 Electric Storage Battery Company, Philadelphia, Pa.
 Electric Taper & Equipment Co., Chicago.
 Engineering News-Record, New York.
 Fairbanks, Morse & Co., Chicago.
 Fairmont Railway Motors, Inc., Fairmont, Minn.
 Fansteel Products Company, North Chicago, Ill.
 Frog Switch & Manufacturing Co., Carlisle, Pa.
 General Cable Corporation, New York.
 General Electric Company, Schenectady, N. Y.
 General Railway Signal Company, Rochester, N. Y.
 Griswold Safety Signal Company, Minneapolis, Minn.
 Harnischfeger Corporation, Milwaukee, Wis.
 Hastings Signal & Equipment Co., Boston, Mass.
 Hayes Track Appliance Company, Richmond, Ind.
 Headley Emulsified Products Company, Philadelphia, Pa.
 Hubbard & Co., Pittsburgh, Pa.
 Illinois Steel Company, Chicago.

Independent Pneumatic Tool Company, Chicago.
 Indianapolis Switch & Frog Co., Springfield, Ohio.
 Industrial Brownhoist Corporation, Cleveland, Ohio.
 Ingersoll-Rand Company, New York.
 Jewell Electrical Instrument Company, Chicago.
 Johns-Manville Corporation, New York.
 Jordan Company, O. F., East Chicago, Ind.
 Kalamazoo Railway Supply Company, Kalamazoo, Mich.
 Kearney Corporation, James R., St. Louis, Mo.
 Kerite Insulated Wire & Cable Co., New York.
 Keystone Grinder & Manufacturing Co., Pittsburgh, Pa.
 Koppel Industrial Car & Equipment Co., Koppel, Pa.
 Layne & Bowler, Inc., Memphis, Tenn.
 Le Carbone Company, Hoboken, N. J.
 Lehon Company, Chicago.
 Locomotive Finished Material Company, Atchison, Kan.
 Long Company, Charles R., Jr., Louisville, Ky.
 Lorain Steel Company, Johnstown, Pa.
 Louisville Frog & Switch Co., Louisville, Ky.
 Lufkin Rule Company, Saginaw, Mich.
 Lundie Engineering Corporation, New York.
 MacRae's Blue Book Company, Chicago.
 Magnetic Signal Company, Los Angeles, Cal.
 Maintenance Equipment Company, Chicago.
 Masey Concrete Products Corporation, Chicago.
 Mechanical Manufacturing Company, Chicago.
 Metal & Thermit Corp., New York.
 Morden Frog & Crossing Works, Chicago.
 Murdock Manufacturing & Supply Co., Cincinnati, Ohio.
 National Carbon Company, New York.
 National Boiler Washing Company of Illinois, Chicago.
 National Lead Company, New York.
 National Lock Washer Company, Newark, N. J.
 National Railway Signal Company, Boston, Mass.
 National Vulcanized Fiber Company, Wilmington, Del.
 Nichols & Brothers, George P., Chicago.
 Nordberg Manufacturing Company, Milwaukee, Wis.
 Northwest Engineering Company, Chicago.
 Northwestern Motor Company, Eau Claire, Wis.
 Ohio Brass Company, Mansfield, Ohio.
 Okonite-Callender Cable Company, Inc., Passaic, N. J.
 Okonite Company, Passaic, N. J.
 Oxweld Railroad Service Company, Chicago.
 P. & M. Company, Chicago.
 Page Steel & Wire Co., Bridgeport, Conn.
 Pettibone Mulliken Company, Chicago.
 Pocket List of Railroad Officials, New York.
 Pomona Pump Company, Pomona, Cal.
 Positive Rail Anchor Company, Chicago.
 Prendergast Company, Marion, Ohio.
 Q and C Co., New York.
 Racor Pacific Frog & Switch Co., Los Angeles, Cal.
 Racine Tool & Machine Co., Racine, Wis.
 Rail Joint Company, New York.
 Railroad Supply Company, Chicago.
 Railroad Accessories Corporation, New York.
 Railway Age, New York.
 Railway Maintenance Corporation, Pittsburgh, Pa.
 Railway Purchases and Stores, Chicago.
 Railway Track-Work Company, Philadelphia, Pa.
 Ramapo Ajax Corporation, New York.
 Reade Manufacturing Company, Jersey City, N. J.
 Reliance Manufacturing Company, Massillon, Ohio.
 Richards-Wilcox Manufacturing Company, Aurora, Ill.
 Roberts Company, George J., Dayton, Ohio.
 Roberts & Schaefer Co., Chicago.
 Robertson Company, H. H., Pittsburgh, Pa.
 Roller-Smith Company, New York.
 Scientific Production Corporation, New York.
 Sellers Manufacturing Company, Chicago.
 Signal Accessories Corporation, Utica, N. Y.
 Sivyer Steel Casting Company, Milwaukee, Wis.
 Skelton Shovel Company, Dunkirk, N. Y.
 Snap-On Wrench Company, Chicago.
 Sperry Products Company, New York.
 Standard Oil Company of Indiana, Chicago.
 Standard Automatic Signal Corporation, Chicago.
 Sullivan Machinery Company, Chicago.
 Syntrol Company, Pittsburgh, Pa.
 Templeton, Kenly & Co., Ltd., Chicago.
 Toncan Culvert Manufacturers' Association, Massillon, Ohio.
 Transportation Publishing Company, Los Angeles, Cal.
 United States Graphite Company, Saginaw, Mich.
 U. S. Wind Engine & Pump Co., Batavia, Ill.

Union Switch & Signal Co., Swissvale, Pa.
 Verona Tool Works, Pittsburgh, Pa.
 Warren Tool & Forge Co., Warren, Ohio.
 Waterbury Battery Company, Waterbury, Conn.
 Western Wheeled Scraper Company, Aurora, Ill.
 Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
 Wharton, Jr., & Co., Inc., William, Easton, Pa.
 Woodings Forge & Tool Co., Verona, Pa.
 Woolery Machine Company, Minneapolis, Minn.
 Weston Electrical Instrument Corporation, Newark, N. J.
 Wyoming Shovel Works, Wyoming, Pa.

Eight Months Net Down 32.9 Per Cent from 1929

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ed to \$466,370,434, compared with \$587,322,415 in August last year, a decrease of 20.6 per cent. Operating expenses totaled \$327,204,298, a decrease of 17.4 per cent.

Class I railroads in the Eastern district for the eight months had a net of \$303,287,488, which was at the rate of 4.02 per cent. For the same period in 1929, their net was \$435,258,316, or 5.92 per cent. Operating revenues in the Eastern district for the eight months totaled \$1,816,693,410, a decrease of 13.9 per cent, while operating expenses totaled \$1,356,570,785, a decrease of 10 per cent. For August the net was \$44,154,939, compared with \$69,580,044 in August 1929.

Railroads in the Southern district for the eight months had a net of \$54,492,645, at the rate of 2.61 per cent. For the same period in 1929, their net amounted to \$88,576,748, at the rate of 4.28 per cent. Operating revenues in the Southern district for the first months amounted to \$441,857,010, a decrease of 14.8 per cent, while operating expenses totaled \$351,191,006, a decrease of 10.1 per cent. Class I railroads in the Southern district for August had a net of \$5,848,822, compared with \$11,129,848 in August, 1929.

In the Western district for the eight months the net was \$197,521,985, at a rate of 3.39 per cent. For the first eight months in 1929, the net was \$304,559,727, at the rate of 5.36 per cent. Operating revenues in the Western district for the eight months amounted to \$1,356,520,997, a decrease of 14.4 per cent, while operating expenses totaled \$1,024,530,624, a decrease of 9.8 per cent. For August, the net railway in the Western district amounted to \$45,600,162. The net of the same roads in August, 1929, totaled \$61,048,609.

CLASS I RAILROADS—UNITED STATES

	Month of August 1930	1929
Total operating revenues	\$466,370,434	\$587,322,415
Total operating expenses	327,204,298	396,204,946
Taxes	32,579,941	38,371,257
Net railway operating income	95,603,923	141,758,501
Operating ratio—per cent	70.16	67.46
Rate of return on property investment	3.38%	5.13%
Eight months ended August 31.		
Total operating revenues	\$3,615,071,417	\$4,213,688,668
Total operating expenses	2,732,292,415	3,035,101,918
Taxes	244,889,277	270,647,132
Net railway operating income	555,302,118	828,394,791
Operating ratio—per cent	75.58	72.03
Rate of return on property investment	3.59%	5.48%

Equipment and Supplies

Locomotives

THE COOS BAY LUMBER COMPANY, Powers, Ore., is inquiring for one 2-8-2 type locomotive.

Freight Cars

THE UNITED FRUIT COMPANY is inquiring for 25 steel fruit cars for the Chiriqui Land Company and for 30 fruit cars for the Tela Railway.

THE MAINE CENTRAL has ordered five hopper cars of 70 tons' capacity from the Standard Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of October 4.

Iron and Steel

THE ATCHISON, TOPEKA & SANTA FE has ordered 61,251 tons of rail as follows: From the Colorado Fuel & Iron Company 47,567 tons, from the Inland Steel Company 6,842 tons and from the Illinois Steel Company 6,842 tons.

THE PERE MARQUETTE has ordered 13,650 tons of rail for 1931 delivery. The order was divided as follows: Bethlehem Steel Company, 2,000 tons; Inland Steel Company, 4,050 tons; Illinois Steel Company, 4,000 tons and Algoma Steel Company, 3,600 tons.

Signaling

THE KANSAS CITY SOUTHERN has ordered from the General Railway Signal Company material for the installation of automatic block signals at Asbury, Mo.; five signals type D, color-light, two model 2A signals, and other material.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the General Railway Signal Company an addition—64 levers—for its large electric interlocking at Mission Tower, Los Angeles, Cal. With this addition the machine will have 102 working levers.

Cab Signals on Canadian National

The Canadian National, acting through the Montreal Terminal Development Company, has contracted with the Union Switch & Signal Company for the installation of automatic block signals and automatic cab signals and speed control, for the line through the new Mount Royal Tunnel at Montreal; 5 miles, double track. The wayside automatic block signals will be color-light and the cab signal system will be three-speed, coded, four-indication, continuous system. This apparatus will be provided for six new electric locomotives and two multiple-unit cars.

Supply Trade

The Worthington Pump & Machinery Corporation, New York, has acquired the Gilman Manufacturing Company, East Boston, Mass.

Lester N. Selig, assistant to the president of the **General American Tank Car Corporation** and the **General American Car Company**, has been elected president of both companies to succeed **Elias Mayer**, resigned.

H. B. Nelson has become associated with the **Prime Manufacturing Company**, Milwaukee, Wis., in a sales and service capacity. Mr. Nelson formerly was shop superintendent of the Chicago & Alton and prior to that general boiler foreman of the Missouri Pacific.

L. B. Mead, manager of the Indianapolis office of the **Westinghouse Electric & Manufacturing Company**, has been appointed industrial manager in the northwest district, with headquarters at Chicago, and is succeeded by **William J. Morgan**, representative at Indianapolis.

Paul Z. Van Zandt, at one time chief engineer of the Asano Portland Cement Company, in Tokyo, Japan, and more recently associated with the Ideal Cement Company, has been appointed assistant to the president of the **Universal Atlas Cement Company**, Chicago.

Lloyd R. Wells has been appointed special railroad representative of the **Babcock & Wilcox Tube Company**, Beaver Falls, Pa. Mr. Wells was formerly district manager of the Carbon Steel Company in New York and before that the Chicago representative of the Midvale Steel Company.

The General Water Treatment Corporation has been organized under Delaware laws as a holding company to merge the interests of the Permutit Company, New York, and the Ward-Love Pump Corporation, Chicago, both specialists in equipment for the softening and purification of water, as well as in allied chemical and mechanical lines. **W. Spencer Robertson**, president of The Permutit Company will be president of the corporation and **Francis N. Bard**, president of the Ward-Love Pump Corporation, will be chairman of the board of directors. Other board members will be: **Vincent Bendix**, **Harry M. Durning**, **William M. Flook** and **Kenneth B. Schley**.

W. R. Van Steenburgh has been appointed manager of the light and power department in the New York office territory for the **Okonite Company** and the **Okonite-Callender Cable Company**. He will direct sales and engineering activities in New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Virginia, and the District of Columbia. Mr. Van Steenburgh has represented the Okonite companies in a

sales capacity since early in 1917. Because of his long experience in the railroad field, his early work with the Okonite Company was confined to that department of the company's business and was later expanded to include the



W. R. Van Steenburgh

power industries. Prior to his association with the Okonite Company, Mr. Van Steenburgh was chief clerk in the purchasing department of the Lehigh Valley.

New Officers of Robert W. Hunt Company

John J. Cone, who has resigned as president of the Robert W. Hunt Company, was one of the founders of that company's predecessor, Robert W. Hunt & Company, having been associated with Captain Robert W. Hunt in 1888, in organizing that firm. In 1923 when its suc-



John J. Cone

cessor, the Robert W. Hunt Company was incorporated, Captain Hunt was its first president and upon Captain Hunt's death in the same year, Mr. Cone was elected president, which position he has filled until his recent resignation.

Charles B. Nolte, vice-president and general manager, has been elected president and general manager with headquarters in the general offices at Chicago. Mr. Nolte was graduated from the University of Illinois in 1909 and soon afterward



Charles B. Nolte

entered the employ of Robert W. Hunt & Company. He served as inspecting and testing engineer in the various departments of this company until 1913, when he was appointed manager of the railway materials inspection and testing department. In 1919 he was appointed assistant to the president, and in 1923 when the company was incorporated under the name of the Robert W. Hunt Company, he was elected vice-president and general manager, which position he has held until his recent promotion.

J. C. Ogden, director and eastern manager, who has been elected vice-presi-



© Bachrach

J. C. Ogden

dent with headquarters at New York, entered the employ of the company almost 30 years ago, as an inspector of structural steel. He was made manager of the New York office in 1906, and when the Robert W. Hunt company was incorporated in 1923, he was elected a director and made eastern manager. Mr. Ogden has specialized in the design and inspection of bridges, steel framed buildings and safe deposit vaults.

Obituary

J. Will Johnson, senior vice-president of the Pyle-National Company, died on the morning of October 2, as the result of injuries received in an automobile accident the previous evening. Mr. Johnson was born on September 10, 1869, at Charleston, S. C. He attended high school at Pierce City, Mo., and began his career in 1884 as a news agent on St. Louis-San Francisco trains. He was later a train crew caller and clerk in the freight office of the St. Louis-San Francisco, and subsequently brakeman, locomotive fireman and locomotive engineer on the same road. In 1902 he entered the employ of the Pyle-National Electric Headlight Company (now Pyle-National Company) as service en-



J. Will Johnson

gineer. In 1904 he was appointed a special representative of the same company and in 1912, director and general manager; two years later he was elected vice-president and general manager, and since 1925 was senior vice-president. Mr. Johnson was also a director and vice-president of the International Railway Supply Company. He was secretary-treasurer of the General Foremen's Association in 1904; president of the Railway Supply Manufacturers' Association in 1914 and 1915, and president of the Railway Equipment Manufacturers' Association in 1912. Mr. Johnson was the author of a series of articles on electric headlights, and was also the author of a Catechism of the Electric Headlight.

THE TEST PASTURES AND HAY FIELDS established by the Central of Georgia, six years ago, with a view to demonstrating the peculiar value of the soil in the south, have shown that winter legumes, properly managed, afford a profitable means of promoting summer crops; and the Agricultural Department of the road advises southern farmers at the present time to plant winter hay. The drought in large sections of the country will, without doubt, cause high prices for hay during the coming year. A combination of grain and winter legumes, planted in the fall and harvested in May, puts the ground in good condition for a following summer crop.

Construction

BALTIMORE & OHIO.—This company has contracted with the Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa., for the erection of a water treating plant at Connersville, Ind., and with the Empire Construction Company, Baltimore, Md., for the construction, at a cost of about \$250,000, of a steel and concrete grade separation structure at Kearneysville, W. Va.

CANADIAN NATIONAL.—This company is receiving bids for the construction of a subway under its tracks on Simcoe Street, Oshawa, Ont.

CHICAGO & NORTH WESTERN.—A contract for the construction of a concrete block and stucco station at Hurley, Wis., has been awarded to Henry Danischewsky, Milwaukee, Wis.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract for the construction of a reinforced concrete highway subway under the tracks of this company at South Walker avenue, Oklahoma City, Okla., has been awarded to John W. Fox, El Reno, Okla., at a cost of about \$200,000.

CINCINNATI UNION TERMINAL.—Bids will be opened on October 20 for the construction of the Western Hills viaduct at Cincinnati, Ohio, as a part of the Union Terminal project in that city. This structure, approximately 3,500 ft. long, will replace the present Harrison Avenue viaduct and will be double decked, the lower deck to be used for street cars and trucks and the upper deck for passenger automobiles. The total cost, including acquisition of land, will be about \$3,500,000, the remainder of the cost to be borne by the Terminal Company and the Baltimore & Ohio.

DONORA SOUTHERN.—This company has let to the Vang Construction Company, Cumberland, Md., a contract for the construction of six miles of railroad, connecting, at Monongahela, Pa., with the Pittsburgh & West Virginia's 38-mile Connellsville extension. The amount involved in this contract is around \$1,200,000.

GREAT NORTHERN.—A contract for the superstructure and machinery for a new 186-ft. deck plate girder swing bridge near Colebrook, B. C., has been let to the Western Bridge Company, Vancouver, B. C.

ILLINOIS CENTRAL.—A contract has been awarded to R. T. Hanrahan for the construction of casements for a viaduct to carry Randolph Street in Chicago over this railroad. The railroad and the city will share the cost, which is approximately \$192,720.

KANSAS CITY SOUTHERN.—This company plans the construction of a brick combined freight and passenger station at Westville, Okla., at a cost of approximately \$25,000.

KANSAS CITY TERMINAL.—A contract has been awarded to the List & Weatherly Construction Company, Kansas City, Mo., for the construction of a 248-ft. conveyor tunnel to connect the sub-basement of the Union station at Kansas City with the basement of the Post Office. This tunnel will involve an expenditure of about \$50,000.

LEHIGH VALLEY.—An estimate of cost amounting to \$102,000, and detailed plans, for the elimination of the Ridge road crossing of the Lehigh Valley in West Seneca, N. Y., have been approved by the New York Public Service Commission.

LONG ISLAND.—In connection with extensive grade separation work at Ozone Park and Corona, N. Y., this company plans the construction of a signal tower and of additional duct lines at Ozone Park and of additional freight and passenger facilities, including a new passenger station, at Corona.

MONESSEN SOUTHWESTERN.—A contract for the construction of a new line in the vicinity of Belle Vernon, Pa., has been awarded to the Vang Construction Company, Cumberland, Md., at a cost of approximately \$200,000. This line is part of a connecting link with the Connellsville extension of the Pittsburgh & West Virginia, and was described in the *Railway Age* of July 19.

MONTANA POWER COMPANY.—A contract has been awarded to the S. Burch & Son Construction Company, Great Falls, Mont., for the construction of a railroad from a point on the Northern Pacific between Pablo, Mont., and Polson, to the site of a power plant on the Flathead river, about eight miles.

NEW YORK CENTRAL.—A contract for the installation of boilers and accessories and of piping for a pumping station at Clinton Point, N. Y., has been awarded to Edward Joy Company, Syracuse, N. Y. Contracts have also been awarded for three grade crossing eliminations as follows: In Holley, N. Y., to the Erie Contracting Company, Buffalo, N. Y., and in Mapleview, N. Y., and Central Square to William M. Ballard, Inc., Buffalo, N. Y.

NEW YORK, PITTSBURGH & CHICAGO.—The Interstate Commerce Commission has assigned this company's application for authority to construct its proposed low-level line from Allegheny to Easton, Pa., for oral argument at Washington on November 18.

NORFOLK & WESTERN.—Contracts have been awarded by this company to J. P. Pettijohn & Company, Lynchburg, Va., for the construction of extensions to its freight terminals at Lamberts Point, Va. This work, which involves an expenditure of more than \$200,000, includes the construction of a 700-ft. addition to warehouse F and a 650-ft. addition to warehouse D. The new additions, which will be of modern, fireproof, brick, concrete and steel construction, will provide the railway with an additional 162,000

sq. ft. of covered floor space in its Lamberts Point warehouses, giving a total of 489,200 sq. ft. of such space, all connected to its merchandise piers by a covered truckway. This company is also engaged, with the four other roads using the facilities, in making extensive improvements to the Union passenger station at Columbus, Ohio, at a cost of about \$750,000. The work includes the construction of a new concourse, the rearrangement of station tracks and the construction of new umbrella-type train sheds.

PITTSBURGH & WEST VIRGINIA.—This company has awarded to the Vang Construction Company, Cumberland, Md., a contract for the construction of four miles of railroad near Connellsville, Pa. The cost of this new line, which is part of the final section of the Pittsburgh & West Virginia's 38-mile Connellsville extension, is about \$800,000.

PORTLAND & SOUTHEASTERN.—This company, of which A. C. Burroughs, of Portland, Ore., is president, has filed an application at the federal land office at Roseburg, Ore., for permission to construct a railroad over Hogg pass in Linn county, Ore., from the junction of Marion creek with the North Santiam river eastward to a point near Sisters.

READING.—This company has prepared plans for the construction of a new brick and terra cotta passenger station, 81 ft. by 27½ ft., and a new brick freight station, 96 ft. by 30 ft., at Royersford, Pa. The passenger station will be located north of the present station and will be provided with a paved train platform 662 ft. long, a waiting room 25 by 34 ft., automobile parking spaces and other necessary conveniences. The freight station, approximately 400 ft. north of the passenger station, will include a 24 ft. by 30 ft. office, a 300 ft. covered platform, and a new automobile unloading platform, and will be served by concrete driveways. The project also involves the elimination of a grade crossing at Main street, and the construction of a ramp to connect this street with the station. Work on these improvements will begin as soon as contracts can be awarded.

TORONTO, HAMILTON & BUFFALO.—This road plans the construction of a new passenger station and the consummation of a grade separation program at Hamilton, Ontario. The project is being carried out in co-operation with the city and plans and the agreement are now before the Board of Railway Commissioners of Canada for approval. The project involves the elevation of T. H. & B. tracks commencing at the east portal of its tunnel and extending to a point beyond Victoria avenue, a distance of approximately one mile. The tracks will be elevated from 2 to 13 ft. and streets will be depressed sufficiently to provide 14-ft. underpasses. The revision will involve five street closings and the construction of seven underpasses. Work will be commenced as soon as the agreement with the city is completed and the order of the railway board is received.

Financial

CHESAPEAKE & OHIO.—*Accounting for Rebuilt Freight Cars.*—The Interstate Commerce Commission has re-opened the case involving the question of the method adopted by this company for accounting for rebuilt freight cars and has assigned it for hearing at Washington on December 1 before Examiner Walton.

CHICAGO GREAT WESTERN.—*Equipment Trust Certificates.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability as lessee and guarantor in respect of \$2,235,000 of equipment trust certificates, series A, to be issued under an agreement dated October 1 and to be sold at not less than 98.03 per cent of par and accrued dividends.

CINCINNATI UNION TERMINAL.—*Bonds.*—This company has been granted authority by the Interstate Commerce Commission to issue \$12,000,000 of first mortgage 4½ per cent bonds to be sold at par and accrued interest, the proceeds to be used for the construction of a passenger station and other facilities at Cincinnati, to reimburse the treasury for expenditures made for such purposes and in the redemption of short term notes. The order also permits the assumption of obligation and liability in respect of the bonds by the Baltimore & Ohio, the Chesapeake & Ohio, the Cincinnati, New Orleans & Texas Pacific, the Cleveland, Cincinnati, Chicago & St. Louis, the Louisville & Nashville, the Norfolk & Western and the Pennsylvania as guarantors and by the New York Central as lessee of the Big Four.

DELAWARE & HUDSON.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a portion of its Honesdale branch, a part of the first railroad of the D. & H. Company and one of the first pieces of railroad built in the United States, from a point near Racket brook to Honesdale, Pa., 23.62 miles. The Honesdale branch extends from Honesdale to Carbondale, 27 miles, and was built in 1828-1829 as a gravity railroad to provide transportation for anthracite coal from mines near Carbondale. Passenger service has already been abandoned on the line and the application states that the remaining freight traffic is insignificant and could as well be moved over other lines or improved highways. The immediate reason for proposing the complete abandonment of the line is that the Pennsylvania commission has issued an order requiring the D. & H. to expend \$20,000 for grade crossing elimination.

INDIANAPOLIS UNION.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$1,000,000 of refunding and improvement mortgage 4½ per cent bonds, to be sold to the Union Trust Company of Pittsburgh at 97¼ and interest. The New York Central, the Pennsylvania and the Cleveland, Cincinnati, Chicago & St.

Louis have asked authority to guarantee the bonds.

NEW YORK CENTRAL.—*Agreement with Fonda, Johnstown & Gloversville.*—The N. Y. C. and the Fonda, Johnstown & Gloversville have submitted to the Interstate Commerce Commission, for its approval, an arrangement of a different character from that provided in the various orders of the commission in the New York Central unification proceeding, but designed to effectuate the underlying purpose of the commission's orders insofar as they relate to the Fonda. The application of the New York Central was granted in January, 1929, on the condition that it should offer to acquire the properties of certain of the short line interveners, including the steam railroads of the Fonda, for a consideration equal to the commercial value of the respective properties, such consideration to be determined either by agreement between the parties or by arbitration. In the case of the Fonda, the Central, pursuant to this condition, offered to acquire its steam railroads, free and clear of all liens and incumbrances, for \$1,400,000, or to rent the same at an annual rental of \$100,000. This was not satisfactory to the Fonda and arbitration was about to be resorted to but it was found that there were so many legal difficulties in the way of separating the steam railroads from the electric railroads of the Fonda that some other arrangement was sought by both parties. The arrangement finally agreed upon provides for a readjustment of the present rate structure and an existing contract between the parties for the use of joint facilities at Fonda, for the purpose of increasing the income of the Fonda and rendering it self-sustaining. If the commission approves what the parties have worked out it is agreed that the Fonda will withdraw its intervention in the unification proceeding, and that the commission may enter an order relieving the Central from further compliance with the orders entered in that proceeding, so far as they relate to the Fonda. Consequently, if this arrangement is approved, the Fonda will retain its present status as an independently operated property without separation of its steam from its electric railroads and without control by the Central under lease or otherwise.

NEW YORK, ONTARIO & WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$3,370,000 of general mortgage bonds, to reimburse its treasury and to be held in the treasury until further order.

PENNSYLVANIA.—*Bonds of the Pittsburgh, Cincinnati, Chicago & St. Louis.*—This company has been authorized by the Interstate Commerce Commission to assume obligation as lessee and guarantor in respect of \$1,908,000 of general mortgage 4½ per cent bonds of the Pittsburgh, Cincinnati, Chicago & St. Louis. These bonds will be delivered to the Pennsylvania and sold by it in settlement of a like amount of indebtedness. An accompanying order permits the Pennsylvania to sell an additional \$21,827,000 of Pittsburgh, Cincinnati, Chicago & St. Louis

4½ per cent bonds, now held by it, at not less than 98¼ per cent of par and accrued interest. This latter is a supplementary order to previous ones which had permitted the delivery of the bonds to the Pennsylvania but had provided that the latter should not dispose of them without further authorization.

PENNSYLVANIA.—Bonds of the Cleveland & Pittsburgh.—The Interstate Commerce Commission has issued an order permitting this company to sell at not less than 98¼ per cent of par and accrued interest \$7,182,000 of general and refunding 4½ per cent mortgage bonds of the Cleveland & Pittsburgh. These bonds have been held by the Pennsylvania since their delivery to it during the past two years in payment of a like amount of indebtedness.

PEORIA TERMINAL.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Peoria, Havana City & Western by purchase of stock and by lease.

PITTSBURGH & SHAWMUT.—Securities.—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of certain securities to be pledged as collateral for a proposed demand note in the amount of \$1,000,000. The plan involves the assumption of obligation and liability under an agreement of indemnity in respect of \$500,000 of Allegheny River Mining Company first mortgage 5 per cent bonds, also of that company's obligation as accommodation maker of the proposed demand note and the assumption of obligation and liability as indorser of two notes, one for \$600,588 issued by the Allegheny River Mining Company and the other for \$322,000 issued by John D. Dickson, receiver of the Pittsburgh, Shawmut & Northern. The aforementioned bonds and notes together with \$1,000,000 of the applicant's first mortgage 5 per cent sinking fund bonds will be pledged as collateral for the demand note.

ST. LOUIS-SAN FRANCISCO.—Bonds.—The Interstate Commerce Commission has authorized this company to issue \$10,000,000 of consolidated mortgage 4½ per cent bonds, to be sold at not less than 90¼ and interest and the proceeds used to pay bank loans and for other capital purposes.

SOUTHERN PACIFIC.—Proposed Acquisition of St. L. S. W.—The Interstate Commerce Commission has authorized the following to intervene as parties to this company's application for authority to acquire control of the St. Louis Southwestern: Groveton, Lufkin & Northern, the Burlington-Rock Island, the Arkansas Railroad Commission, the St. Louis-San Francisco, the St. Louis, San Francisco & Texas, and the Fort Worth & Rio Grande.

WESTERN PACIFIC.—Bonds.—The Interstate Commerce Commission has authorized this road to issue \$5,000,000 of first mortgage 5 per cent bonds to be sold to the highest bidder but at not less than 97½ per cent of par and accrued interest, the proceeds to be used in connection

with the construction and acquisition of certain lines.

WHEELING & LAKE ERIE.—Final Valuation.—The Interstate Commerce Commission has found the final valuation of the property owned and used for common-carrier purposes as of 1918 to be \$41,417,800 and that of the Lorain & West Virginia to be \$1,155,810. The Wheeling in its protest against the tentative valuation had alleged that its actual value was at least \$145,064,825. The investment in road and equipment as shown on the books was \$77,759,611, which, with readjustments made in conformity with the present accounting classification, would be decreased to \$76,472,799.

WHEELING & LAKE ERIE.—Proposed Acquisition by P. & W. V.—The Pittsburgh & West Virginia and the New York, Chicago & St. Louis have filed with the Interstate Commerce Commission statements of exceptions to the recent report by C. V. Burnside, assistant director of the commission's Bureau of Finance, in which he recommended that the commission deny the application of the P. & W. V., for authority to acquire control of the Wheeling, without prejudice to the submission of a later application. The P. & W. V. objects to the recommendation that the commission disapprove the plan until the applicant's plans for acquiring other roads are more fully developed, saying that the law provides for the combination of two or more roads at a time, and it lays emphasis on the fact that the commission's consolidation plan places the two roads in the same system. The New York, Chicago & St. Louis, while approving the general recommendation that the application be denied, objects that the proposed report does not include specific findings which it had proposed. It asks that the report be recommitted to Mr. Burnside with directions to consider the exceptions filed, and, if in his judgment such course should be taken, to prepare and serve a new proposed report in which the findings specifically requested by the Nickel Plate and the exceptions of all parties shall be considered. The Nickel Plate says the application "is part of a scheme and conspiracy to enable the Pennsylvania Railroad Company to continue its stranglehold on the Pittsburgh district and the Pittsburgh gateway, and to prevent the Nickel Plate and other lines in System No. 6 from forming a system capable of effective competition with the Pennsylvania and generally to stifle competition in the eastern district."

Dividends Declared

Atchison, Topeka & Santa Fe.—Common, \$2.50, quarterly, payable December 1 to holders of record October 31.
Carolina, Clinchfield & Ohio.—Stamped Certificates, 1¼ per cent, quarterly, payable October 10 to holders of record September 30.
Missouri-Kansas-Texas.—Common, \$1.00, payable December 31 to holders of record December 5.

Average Prices of Stocks and of Bonds

	Oct. 7	Last week	Last year
Average price of 20 representative railway stocks.	102.88	104.41	153.43
Average price of 20 representative railway bonds.	95.87	96.18	89.31

Railway Officers

Executive

Edwin E. Tait, president and general counsel for the Pittsburgh & Shawmut, with headquarters at Pittsburgh, Pa., has retired, and **R. M. Shepherd** has been appointed to succeed him as president of that road.

Lewis Neilson, vice-president in charge of the secretarial department of the Pennsylvania, retired under pension regulations on September 30, after more than 49 years of service with that system. Mr. Neilson was born at Florence, N. J., on September 30, 1860, and is a graduate of the Academy of the Protestant Episcopal church and of the University of Pennsylvania. He entered railroad service on June 20, 1881, with the Pennsylvania, as weighing clerk on the Walnut Street wharf, Philadelphia, Pa. From October 1 to December 10, 1881, he was assistant receiving clerk, and from the latter date to October 23, 1882, he filled various positions in the cashier's department. On October 23, 1882, he was promoted



Lewis Neilson

to stenographer in the trace and claim department. He served there until July 16, 1883, when he entered the office of Capt. John P. Green, then fourth vice-president, as stenographer. On December 1, 1885, he was promoted to chief clerk in that office and continued to occupy the same position under Captain Green's several promotions to first vice-president. In May, 1897, Mr. Neilson was appointed chief clerk to the secretary and in June 1898, became assistant-secretary of the Pennsylvania. In January 1901 he was promoted to the position of secretary of the Pennsylvania and of the Philadelphia, Wilmington & Baltimore (now the Philadelphia, Baltimore & Washington, a subsidiary of the Pennsylvania). He was later appointed secretary of many of the companies included in the western lines, in addition to those of the eastern lines, thus mak-

ing him secretary of 112 companies, embracing all of the operating railroad companies and nearly all of the leased and associated companies of the Pennsylvania system. On December 1, 1929, he was appointed to the newly created position of vice-president secretarial department, which duties he now relinquishes.

Financial, Legal and Accounting

William N. Cott has retired as assistant treasurer of the Chesapeake & Ohio, with headquarters at Columbus, Ohio, following 55 years of service with that road and the Hocking Valley.

Elmer J. Halberg has resigned from the position of attorney for the New York, Chicago & St. Louis, at Cleveland, Ohio, to become general counsel for the Pittsburgh & Shawmut, with headquarters at Kittanning, Pa.

Charles Franklin, general attorney for the Southern Pacific, with headquarters at New York, plans to return to private practice in that city on January 2, 1931. Mr. Franklin, who was born on December 26, 1885 at Buffalo, N. Y., and was educated at New York University and New York Law School, entered the service of the Southern Pacific as attorney in June, 1901, and subsequently served as attorney and general counsel with the Southern Pacific-Union Pacific (Harriman System) from the time of the acquisition of the S.P. Lines by the late E. H. Harriman up to the segregation of the systems. During his connection with the Harriman Lines he was legal adviser to all system representatives and had charge of all litigation at New York.

Operating

G. A. McCullough, acting car accountant of the Panhandle & Santa Fe, has been appointed car accountant, with headquarters at Amarillo, Tex.

F. M. Bailey, chief dispatcher of the Atlanta division of the Nashville, Chattanooga & St. Louis, has been promoted to trainmaster of that division at Atlanta, Ga.

The New York, Chicago & St. Louis has established the Chicago Terminal division, consisting of the portion of its lines west of and including Hobart, Ind., and now a part of the Chicago division. **A. D. Peters**, superintendent of the Chicago division, has been appointed superintendent of the Chicago Terminal division, with headquarters at Stony Island, Ill. The jurisdiction of **Ogden Pierce**, superintendent of the Fort Wayne division at Fort Wayne, Ind., has been extended to include the portion of the Chicago division east of Hobart.

J. P. Cowley, assistant to the general manager of the Gulf, Colorado & Santa

Fe, has been appointed superintendent of the Galveston division, with headquarters as before at Galveston, Tex., succeeding **Albert P. Hall**, who has retired. Mr. Hall has completed 55 years of railway service, 42 of which were with the Santa Fe System. He was born at Minneiska, Minn., on April 21, 1859, and obtained his first railroad experience as a telegraph operator on the Chicago, Rock Island & Pacific in 1875. Five years later he became a telegraph operator on the Santa Fe, then serving that road successively as train dispatcher, freight clerk, local freight agent at Albuquerque, N. M., and Denver, Colo., and assistant division superintendent and agent at Pueblo, Colo. In 1894 Mr. Hall became general agent for the Rio Grande Western (now part of the Denver & Rio Grande Western) at Ogden, Utah, and three years later he was appointed superintendent and general agent of the St. Joseph Terminal at St. Joseph, Mo. He returned to the Santa Fe in 1902 as trainmaster at Temple, Tex., and was then promoted and transferred successively to superintendent of the Galveston terminals, superintendent of the Beaumont division and superintendent of the Northern division. On August 10, 1908, Mr. Hall was transferred to the Galveston division, a superintendency he held until his retirement.

Traffic

F. B. Griffin, division passenger agent on the Missouri-Kansas-Texas at San Antonio, Tex., has been promoted to assistant general passenger agent—solicitation, at Dallas, Tex.

James M. Skaehill, division freight agent of the Erie, with headquarters at Meadville, Pa., has been appointed industrial agent, with headquarters at Cleveland, Ohio, to succeed **L. C. Kerner**, who resigned to become vice-president of the Standard Car Loading Company.

Engineering, Maintenance of Way and Signaling

S. F. Ryan, maintenance inspector of the Wabash, with headquarters at St. Louis, Mo., has been promoted to division engineer of the Springfield division, with headquarters at Springfield, Ill. **A. P. Gardner** has been appointed maintenance inspector of the Wabash, succeeding Mr. Ryan.

M. B. Kent, division engineer of the Houston division of the Missouri Pacific Lines, has been transferred to the Houston Terminal division, with headquarters as before at Houston, Tex. The position of division engineer of the Houston division has been abolished and the lines under that jurisdiction have been added to the Palestine division, of which **Sidney Beacon** is division engineer, with headquarters at Palestine, Tex. **J. E. Rosenbalm**,

general foreman of bridges and buildings at Palestine, has been promoted to general inspector of bridges and buildings, with headquarters at Houston, a newly created position.

Mechanical

The titles of the superintendents of motive power and machinery of the units of the Union Pacific System, **J. W. Burnett**, Union Pacific; **J. W. Highleyman**, Oregon Short Line; **C. E. Peck**, Oregon-Washington Railroad & Navigation Company, and **J. F. Long**, Los Angeles & Salt Lake, have been changed to assistant general superintendents of motive power and machinery with the same jurisdiction.

J. Shelaberger, master mechanic of the San Joaquin division of the Southern Pacific, with headquarters at Bakersfield, Cal., has been transferred to the western division with headquarters at West Oakland, Cal., to succeed **F. C. Keim**, deceased, and is succeeded by **J. J. Keller**, assistant master mechanic on the Salt Lake division, with headquarters at Sparks, Nev., who in turn is succeeded by **A. B. Wilson**, assistant master mechanic at West Oakland.

Purchases and Stores

K. R. Lutz, section storekeeper on the Chesapeake & Ohio at Stevens, Ky., has been promoted to storekeeper at Shelby, Ky.

Obituary

P. H. Byers, general freight agent of the Chicago & Eastern Illinois, with headquarters at Evansville, Ind., died in that city on October 5.

Richard V. Holder, general agent of the Chicago & North Western, with headquarters at San Francisco, Cal., died in that city on October 5.

Robert L. Dillon, district storekeeper on the Missouri-Kansas-Texas at Sedalia, Mo., until his retirement in 1929, died recently at Denison, Tex.

Samuel L. Racey, superintendent of the Denver & Rio Grande Western, with headquarters at Salt Lake City, Utah, died on October 3, from intestinal trouble.

David T. Crawford, superintendent of the Chicago division of the Grand Trunk Western, with headquarters at Battle Creek, Mich., died at his home in that city on October 1, following an illness of several weeks from heart disease.

Donald K. Crawford, assistant signal engineer of the Southern district of the Western lines of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., died in St. Anthony's hospital in that city on September 9. Mr. Crawford had served for 17 years in the engineering and signal departments of the Santa Fe in the Southwest.